



EUROPEAN  
GEOPHYSICAL  
SOCIETY

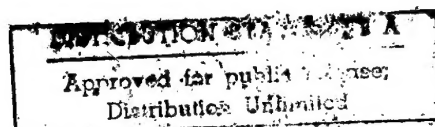
European Geophysical Society

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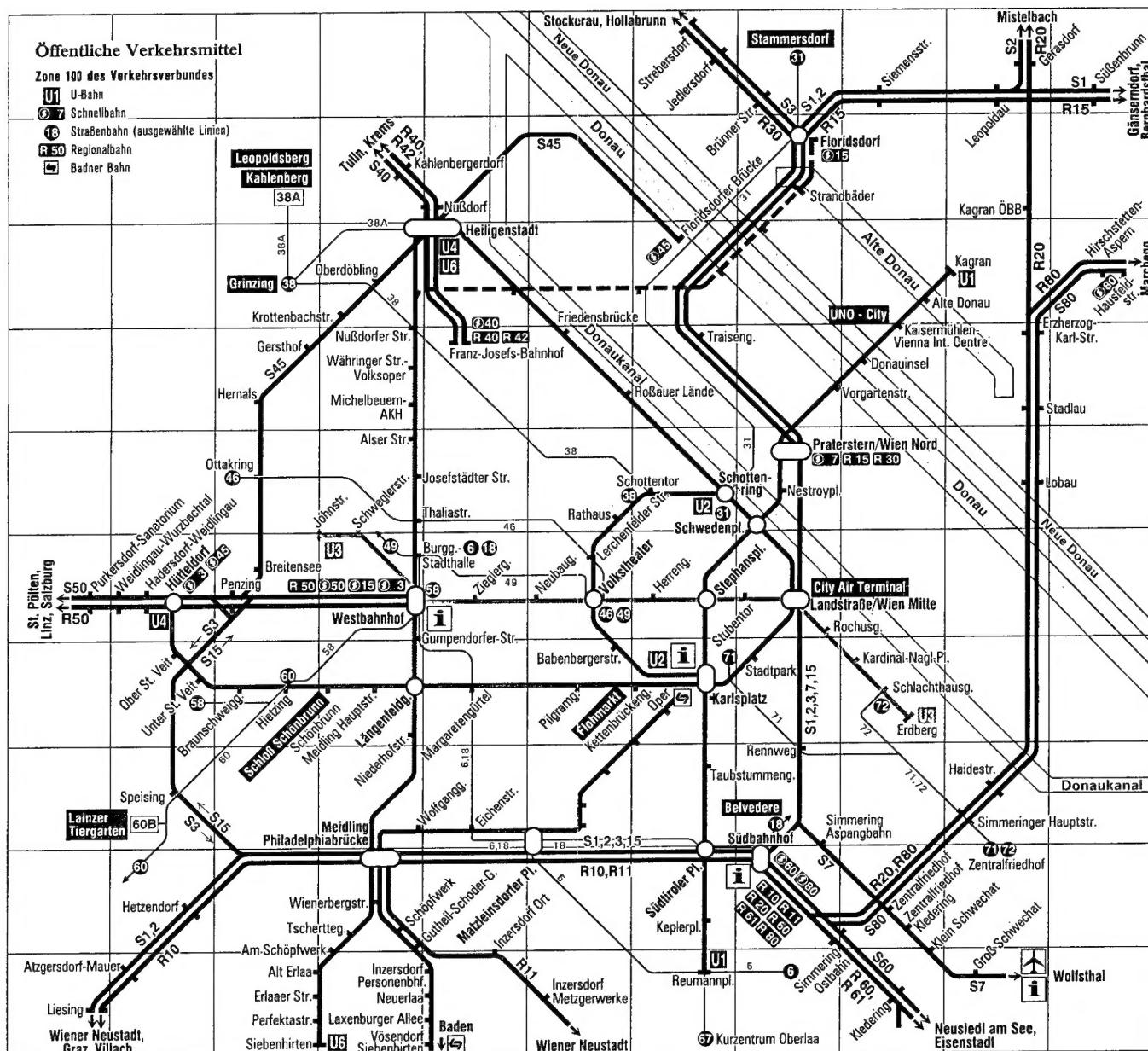
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# Newsletter

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Number 60 September 1996  
General Assembly Vienna 1997



# Lufthansa

**Official Airline for the XXII General Assembly, Vienna, Austria, 21-25 April 1997.**

Lufthansa Airlines offers a comprehensive global network of flights linking Vienna with most major cities throughout the world and to participants and accompanying persons very special airfares. For your personal offer please contact your nearest Lufthansa office and present your registration or invitation and refer to code **GGAIRLHKONG**.

**REPORT DOCUMENTATION PAGE**

Form Approved OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington, DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE  20 May 1997		3. REPORT TYPE AND DATES COVERED  Conference Proceedings	
4. TITLE AND SUBTITLE  Geophysics including meteorology, ionospheric physics, space physics, geochemistry, seismology, paleo magnetism, plate tectonics				5. FUNDING NUMBERS  F6170897W0116	
6. AUTHOR(S)  Conference Committee					
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)  Rutherford Appleton Laboratory Chilton, Didcot OX11 0QX United Kingdom				8. PERFORMING ORGANIZATION REPORT NUMBER  N/A	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)  EOARD PSC 802 BOX 14 FPO 09499-0200				10. SPONSORING/MONITORING AGENCY REPORT NUMBER  CSP 97-1048	
11. SUPPLEMENTARY NOTES  3 Volumes plus a newsletter.					
12a. DISTRIBUTION/AVAILABILITY STATEMENT  Approved for public release; distribution is unlimited.				12b. DISTRIBUTION CODE  A	
13. ABSTRACT (Maximum 200 words)  The Final Proceedings for European Geophysical Society XXII General Assembly, 21 April 1997 - 25 April 1997  The Topics covered include: Geophysics including meteorology, ionospheric physics, space physics, geochemistry, seismology, paleo magnetism, plate tectonics					
14. SUBJECT TERMS  Space Science, Geophysics, Remote Sensing, Space Environment				15. NUMBER OF PAGES  908	
				16. PRICE CODE N/A	
17. SECURITY CLASSIFICATION OF REPORT  UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE  UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT  UNCLASSIFIED		20. LIMITATION OF ABSTRACT  UL	



# European Geophysical Society XXII General Assembly Vienna, Austria, 21-25 April 1997



## General Information

### Location & Date

The 22nd General Assembly of the European Geophysical Society will be held at the **Austria Center Vienna** from 21-25 April, 1997. The assembly will be accompanied by an exhibition and by many other activities and events, and it will be open to all scientists of all nations.

The Austria Center Vienna or the Vienna Int. Centre is located on an island between the "old" and the "new" Danube river and next to the UN City.

The official address is:

Austria Center  
Internationales Amtssitz- und  
Konferenzzentrum Wien  
EGS97  
Am Hubertusdamm 6  
A-1220 Wien  
Austria

Tel: +43-1-2369-0  
Fax: +43-1-2369-303

### Official Language

The official language of the General Assembly will be English. Simultaneous interpretation will not be provided. It is therefore expected that authors are able to present their research more or less fluently in the English language.

### Local Organization

The local organization of the 22nd General Assembly is supported by the Austrian Local Advisory Committee, the Chairman of which is M. Hantel (Institut für Meteorologie und Geophysik, Wien), and the Members of which are S. Bauer (Institut für Weltraumforschung, Graz), M. Kuhn (Institut für Meteorologie und Geophysik, Innsbruck), G. Kurat (Naturhistorisches Museum, Wien), P. Steinhauser (Universität Wien)

### Travel to Vienna

#### By plane

More than 35 different carriers are flying directly to the Vienna airport "Wien-Schwechat". From here the city can be reached either by taxi (approx. ATS 400,-) or by shuttlebus (approx. ATS 70,-) to the City Air Terminal or by the commuter train S7 (approx. ATS 35,-) to the City Air Terminal or, even better, to "Praterstern/Wien Nord".

#### By train

Vienna has two main stations: "Westbahnhof" and "Südbahnhof". From "Westbahnhof" one may proceed with the underground lines U3 to "Stephansplatz" and U1 to "Vienna

Int. Centre", and from "Südbahnhof" with the commuter line S7 to "Praterstern/Wien Nord" and by U1 to "Vienna Int. Centre".

#### By car

Vienna can be reached by car on the motorways A1 (west), A22 (north), A4 (east) and A2/21 (south). The congress centre has its own indoor car park. Parking costs have to be paid directly by the participants.

### Local Transportation

Participants will receive a single pass together with their name badge, which will allow them to use the entire local transportation within Vienna and its outskirts free of charge from Monday, 21 April, to Friday, 25 April, 1997.

For local transportation to/from the congress centre it is recommended to use the underground U1, exit "Kaisermühlen-Vienna Int. Centre".

### Visa Requirements & Health Insurance

Visitors from outside the European Union (EU) should check whether or not a visa is required. In most cases a valid passport will be sufficient.

Moreover, visitors from central and east Europe should check whether or not a special health insurance is required for their stay in Austria. Any insurance fee will be covered by the organizers.

The Society or the Conveners on behalf of the Society will be happy to send a personal invitation for participation in the meeting including a statement about health insurance, if requested. It should be understood that such an invitation is only to help visitors to raise travel funds or to obtain a visa. An invitation is not a commitment on the part of the organizers to provide financial support.

### Insurance

The organizers cannot accept liability for personal accident, loss or damage to private property, which may be incurred as a result of the participation in the EGS meeting. Participants are, therefore, advised to arrange appropriate insurance cover. This should extend not only to travel but also to cancellation costs.

### Pre-Registration

Participants are advised to register in advance by using the *Pre-Registration Form*, in particular, since by **mid-March 1997** all main authors will have been notified on the acceptance, day and time of their contribution. The final deadline for pre-registration will be **28 March 1997**. Afterwards, only on-site registration at much higher rates is possible.



The pre-registration fees are:

<u>before</u>	<u>31 January 1997</u>
EGS Members 1997	DM 320,-
EGS Student Members 1997	DM 170,-
EGS Non Members	DM 380,-
EGS Non Student Members	DM 200,-
Retired Scientists	DM 170,-

<u>before</u>	<u>28 March 1997</u>
EGS Members 1997	DM 370,-
EGS Student Members 1997	DM 220,-
EGS Non Members	DM 430,-
EGS Non Student members	DM 250,-
Retired Scientists	DM 220,-

Payments may be made by cheque or credit card and in the currencies Deutsche Marks, French Francs, Pounds Sterling, Swiss Francs and US Dollars (see the Pre-Registration Form for conditions and conversion rates).

It should be noted that only those participants may register as EGS Members/EGS Student member who will actually have renewed their membership for 1997 and will have received their **1997 Membership Card**. Participation in any previous General Assemblies of the Society does not automatically include the membership in the EGS for 1997.

Members of the following cooperating societies may register at the membership rate: American Geophysical Union (AGU) (only for members with an address outside of Europe), Danish Geophysical Society (DGS), Norwegian Geophysical Society and Swedish Geophysical Society (SGS).

### Waiving of Registration Fees

In general, each participant in an EGS General Assembly has to pay registration fee. These fees will be waived only for scientists receiving a Young Scientists' Travel Award, a Keith Runcorn Travel Award, an East European Support Award, a Society Award or Medal, or if a grant provided by a third party requires free registration.

### Benefits

The registration fee includes the publication of abstracts free of charge in *Annales Geophysicae*, the conference material incl. the Book of Abstracts and the Programme Booklet, refreshments during breaks and the participation in the ice breaker reception and in all other activities during the meeting. Participants who will register at the full-meeting non-member or student non-member rate, will become EGS members at no extra charge for 1997.

### Pre-Reservation of Accommodation

Participants are advised to book their accommodation well in advance by using the *Hotel Reservation Form*. The final deadline for pre-reservation will be **21 March 1997**. Naturally, any reservation received later will also be accepted and on-site hotel booking will also be possible.

The hotel booking agent is:

MONDIAL CONGRESS Tel: +43-1-58804-0  
Faulmannsgasse 4 Fax: +43-1-586-9185  
A-1040 Vienna E-mail: congress@mondial.via.at  
Austria

Hotel rooms have been reserved mainly around the centre of Vienna and along the main underground and tram lines providing an easy access to U1 and to the congress centre.

For youth hostel accommodation we recommend to contact the following address directly:

Jugendgästehaus Wien Brigittenau Tel: +43-1-332-8294  
Friedrich Engels Platz 24  
A-1200 Vienna  
Austria  
(reservation through IBN-system possible)

### On-Site Registration & Hotel Booking

Participants are advised to take advantage of the possibilities of pre-registration and pre-booking of accommodation. Otherwise on-site registration and hotel booking is possible at the Congress Counter.

The Congress Counter will be located in the entrance hall of the congress centre. The opening hours will be:

<b>Sunday, 20 April 1997</b>	<b>15.00-20.00</b>
<b>Monday-Friday, 21-25 April 1997</b>	<b>08.00-18.00</b>

Final, on-site and day registration, on-site hotel booking and the EGS support awards will be handled at this counter at any time during its opening hours.

The registration fees at the conference site are:

EGS Members 1997	420,- DM
EGS Student Members 1997	270,- DM
Non EGS Members	480,- DM
Non EGS Student Members	300,- DM
Retired Scientists	270,- DM
Regular Day Ticket	250,- DM
Student Day Ticket	150,- DM

All payments for registration may be made by cash in Austrian Schillings (ATS) at the actual conversion rate, by Eurocheque, by cheque in the currencies Deutsche Marks, French Francs, Pounds Sterling, Swiss Francs or US Dollars (see the Pre-Registration Form for conditions and conversion rates) or by credit card (American Express, Eurocard/Mastercard or VISA).

Participants intending to register at the 1997 EGS Member/Student Member rates should be able to show their personal "1997 EGS Membership Card"; for membership in the EGS please contact the EGS Office (egs@linax1.mpa.gwdg.de). Participants that will register at the Non Member/Non Student Member rates will become Member of the EGS for 1997.

## General Services

In the entrance hall of the conference centre there are public, international telephones and telefax machines as well as a photocopier. In a special office "word processing" (WORD, WordPerfect) with PC's and laserprinters will be made available. Moreover, it is envisaged to install Internet.

## Bank & Post Office

There will be a bank counter and a post office in the conference centre, which will be opened during conference hours.

## Travel Agent

A special hospitality counter will be available in the entrance lobby of the congress centre for flight information and confirmation, selling of tickets for public transport, reservation of restaurants, booking of sightseeing tours etc.

## Conference Hours & Breaks

The general conference hours are:

Morning  
Monday-Friday 09.00-12.30/13.00

Afternoon  
Monday & Tuesday 14.00-16.30  
Wednesday-Friday 14.00-18.30

During the breaks indicated in the programme coffee or other refreshments will be served. These breaks will be scheduled for about 30 min. for

Morning  
Monday-Friday 10.30-11.00

Afternoon  
Monday & Tuesday 16.30-17.00  
Wednesday-Friday 15.30-16.00

Lunch hours will be scheduled for

Monday-Friday 12.30/13.00-14.00

and the Opening Ceremony followed by the Open Reception will be scheduled

Monday 17.00-22.00

At lunch times, hot lunch, salads, deserts and drinks will be served in the restaurants of the congress centre.

## EGS Support Programmes

In principle, it is expected that authors of contributions, which have been accepted and scheduled for presentation, will secure their participation in the General Assembly on their own without any financial assistance provided by the Society. However, since the whole concept of the EGS has been significantly motivated by the recognition of the value of giving an opportunity to the younger and more recently established scientists in the geophysical disciplines in Europe to attend the General Assemblies and to meet with each other and with their more senior colleagues, and since the EGS believes that a more open and intense partnership with colleagues from the formerly communist countries in Europe is mandatory at a time when Europe and the Europeans are moving together more closely, the EGS has initiated three support programmes to financially assist the attendance of young scientists and of scientists from the central and east European countries at its General Assemblies. These schemes are the

- Young Scientists' Travel Award
- Keith Runcorn Travel Award
- East European Support Award

Any expenditure for these grants has to be part of the overall budget of a General Assembly. Since the major income is through the registration fees, it is only natural that the amount reserved for these support schemes can only be a very limited one and, secondly, that only the very best applicants can be considered as candidates for a grant. Therefore, applications for financial support are very critically reviewed by the appropriate Convener(s) in view of their excellence and importance for the meeting. Based on the recommendation of the Conveners, the EGS Programme Committee on behalf of the EGS Council selects the candidates for the corresponding EGS support awards.

## Conference Material

The conference material will include the name badge together with a pass allowing for a free use of public transportation within Vienna and its major outskirts from Monday-Friday, 21-25 April 1997, a bag, the Programme Booklet, one volume of the Book of Abstracts, and some general information about Vienna and a map of the public transportation.

## Exhibition

The conference will be accompanied by an exhibition of the most important European publishers, of the American Geophysical Union (AGU), and of several important companies. The exhibition will be located on the 1st floor of the congress centre, and it will be opened from Tuesday-Thursday, 22-24 April 1997.

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## Invitation to the Opening Ceremony, Society Lecture and Reception Austria Center Vienna, Monday, 21 April 1997, 17.00-22.00

Welcome by the President of the European Geophysical Society • Welcome by the representatives of other organizations • Presentation of the EGS Awards and Medals • Plenary Meeting • Society Lecture • Open Reception

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# Lufthansa

**Official Airline for the XXII General Assembly of the European Geophysical Society, 21-25 April 1997, Vienna, Austria.**

Lufthansa Airlines offers a comprehensive global network of flights linking Vienna with most major cities throughout the world.

Additionally, Lufthansa is offering participants and accompanying persons special airfares. For your personal offer please contact your nearest Lufthansa office. Kindly present your registration or invitation and refer to code **GGAIRLHKONG**.

## Milutin Milanković 1879-1958



An extract from his *autobiography* compiled by his son, Vasko, describing in detail the way his father derived his mathematical theory of the glacial and inter-glacial cycles, of the Earth's rotation and of plate tectonics as well as his exchange of ideas with the other pioneering geophysicists of his time, such as Köppen, Brückner, Zeuner, Wegener, and others.

### Normal Member Price (\*):

45,- DEM / 35,- USD / 22,- GBP / 175,- FRF

(\*) for members of any national or international scientific society/union.

### Payment by *cheque*

(in the currency of the country of the bank on which the cheque is actually drawn)

With a *preface* by André Berger explaining the historical background for the astronomical theory of palaeo-climates and the pioneering contribution of Milanković.

A *book*, leather bound, published in English, 181 pages, 51 photographs and figures and 12 facsimiles and their translations. ISBN 3-9804862-0-6.

### Normal List Price:

60,- DEM / 46,- USD / 29,- GBP / 230,- FRF

### Payment by *credit card*

(VISA, American Express, Eurocard/Mastercard; processed in DM at most favourable conversion rates)

There is a 10% discount on all orders arriving before 31 December 1996 at:

EGS Office  
Max-Planck-Str. 1  
37191 Katlenburg-Lindau  
Germany

Tel: +49-5556-1440  
Fax: +49-5556-4709  
NSP::LINMPI::EGS  
EGS@LINAX1.MPAE.GWDG.DE

EUROPEAN GEOPHYSICAL SOCIETY  
XXII GENERAL ASSEMBLY

Vienna, 21 - 25 April 1997

PRE-REGISTRATION FORM

Deadline for Pre-Registration: 28 March 1997

General Information (please print all information clearly)

☐ Dr. ☐ Prof. ☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other.....

First Name ..... Initials .....

Last Name .....

Department/Institute .....

Company/University .....

P.O.Box/Street .....

ZIP Code ..... City .....

Country .....

Phone ..... Fax .....

E-Mail ..... Telex .....

Areas of Interest (please tick)

- ☐ Solid Earth (SE)  
☐ Geodesy (G)  
☐ Hydrological Sciences (HS)  
☐ Oceans & Atmosphere (OA)  
☐ Solar-Terrestrial Sciences (ST)  
☐ Planetary & Solar System Sciences (PS)  
☐ Nonlinear Processes in Geophysics (NP)  
☐ Natural Hazards (NH)

Conference Badge (your preference)

Name:	.....
Institute:	.....
Country:	.....

Registration Fees (please tick appropriate rates)

Fees before	31 January 1997	28 March 1997	On-Site
EGS Members 1997 <sup>(1)</sup>	<input type="checkbox"/> 320,- DM	<input type="checkbox"/> 370,- DM	<input type="checkbox"/> 420,- DM
EGS Student Members 1997 <sup>(1) (*)</sup>	<input type="checkbox"/> 170,- DM	<input type="checkbox"/> 220,- DM	<input type="checkbox"/> 270,- DM
Non EGS Members	<input type="checkbox"/> 380,- DM	<input type="checkbox"/> 430,- DM	<input type="checkbox"/> 480,- DM
Non EGS Student Members <sup>(*)</sup>	<input type="checkbox"/> 200,- DM	<input type="checkbox"/> 250,- DM	<input type="checkbox"/> 300,- DM
Retired Scientists <sup>(*)</sup>	<input type="checkbox"/> 170,- DM	<input type="checkbox"/> 220,- DM	<input type="checkbox"/> 270,- DM
Regular Day Ticket			<input type="checkbox"/> 250,- DM
Student Day Ticket			<input type="checkbox"/> 150,- DM

(1) Participants having paid the annual EGS membership fee for 1997.  
 (\*) Please enclose proof of status.

Accepted Currencies & Conversion Rates

Besides in Deutsche Marks (DEM/DM), cheque payment is also accepted in the following currencies:

Swiss Francs  
 CHF = 0.90 x DEM  
 Pounds Sterling  
 GBP = 0.49 x DEM  
 French Francs  
 FRF = 3.90 x DEM  
 US Dollars  
 USD = 0.78 x DEM

Attention: Cheques or payment orders, other than Eurocheques including filled-in card numbers, will only be accepted when written in the currency of the country of the bank on which the cheque or payment order is actually drawn.

Conditions and Cancellation Deadline

- Pre-Registration is only processed after the receipt of payment on the EGS account. Otherwise the on-site registration fee will be taken as a basis.
- Registration fees will only be refunded, if the notice of cancellation is received by the EGS Office before 28 March 1997. The cancellation fee is DM 20,-.

Method of Payment

- ☐ Cheque enclosed for Currency ..... Amount .....
- ☐ Please charge DM ..... to my credit card
- ☐ American Express ☐ VISA ☐ Eurocard/Mastercard/Access
- Credit Card No. .... Expiration Date .....

Date ..... Signature .....

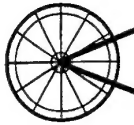
Please, return to:

EGS Office  
 Max-Planck-Str. 1  
 37191 Katlenburg-Lindau  
 Germany  
 Tel: +49-5556-1440  
 Fax: +49-5556-4709  
 SPAN: NSP::LINMPI::EGS  
 INTERNET: EGS@LINAX1.MPAE.GWDG.DE



EUROPEAN GEOPHYSICAL SOCIETY  
XXII GENERAL ASSEMBLY

Vienna, 21 - 25 April 1997



### HOTEL RESERVATION FORM

**Deadline for Pre-Reservation: 21 March 1997**

#### General Information *(please print all information clearly)*

☐ Dr. ☐ Prof. ☐ Mr. ☐ Mrs. ☐ Ms. ☐ Other .....

First Name ..... Initials .....

Last Name .....

Department/Institute .....

Company/University .....

P.O.Box/Street .....

ZIP Code ..... City .....

Country .....

Phone ..... Fax .....

E-Mail ..... Telex .....

#### Reservation required for

Arrival: ...../04/1997 Departure: ...../04/1997 Number of Nights: .....

Category	No.	Single Room	No.	Double Room	Deposit
*****		2.300,- ATS*		2.700,- ATS*	2.500,- ATS
****		1.000,- ATS - 1.900,- ATS		1.600,- ATS - 2.400,- ATS	1.500,- ATS
***		600,- ATS - 1.150,- ATS		850,- ATS - 1.550,- ATS	1.000,- ATS

\* breakfast not included

In case the desired rate category is not available, please reserve category: .....  
Room rates are indicated in Austrian Schilling (ATS) and include buffet breakfast (except for the \*\*\*\*\* category). You are kindly requested to provide a deposit to secure your hotel reservation.

☐ Please send information about less expensive accommodation.

Special requests: .....

☐ I will contact directly the following youth hostel:

Jugendgästehaus Wien Brigittenau  
Friedrich Engels Platz 24  
A-1200 Vienna  
Austria  
(reservation through IBN-system possible)  
Tel: +43-1-332-8294

#### Conditions of Reservation

Mondial Congress has reserved a sufficient number of rooms in hotels of different categories for the participants of the congress.

To guarantee your hotel reservation a deposit of ATS 2.500,- for a room in the \*\*\*\*\* hotel, ATS 1.500,- for a room in the \*\*\*Hotel and ATS 1.000,- for a room in the \*\* hotel is required. For less expensive accommodation, please contact Mondial Congress directly. The hotel voucher will be sent to you after receipt of the deposit, approx. 2 weeks prior to the congress. The balance between the value of the voucher and your total hotel invoice has to be settled directly with the hotel. Any bank charges will be deducted from your hotel deposit.

#### Cancellation of Hotel Reservation

In case of cancellation less than 4 weeks prior to the congress, the hotel deposit will be forfeited. Cancellation or changes can only be accepted in writing.

#### Method of Payment

☐ by bank transfer of ATS ..... to bank account no. 0964-64367/00 with the Creditanstalt Bankverein, Rilkeplatz 8, A-1043 Vienna, bank code 11000, issued in ATS with "Vienna" as the place of issue and marked "free of charge for the beneficiary". Any bank charges must be covered by the participant.

☐ by enclosed Eurocheque for the amount of ATS ..... made out to Mondial Congress (ATS 2.500,- max. per cheque)

☐ by credit card for the amount of ATS .....

☐ Eurocard/Mastercard ☐ Visa ☐ American Express ☐ Diners

Credit Card No. .... Expiry Date .....

Name of Card Holder .....

Date ..... Signature .....

With his signature on the reservation form the participant accepts the above mentioned conditions.

Please return to:

**MONDIAL CONGRESS**  
Faulmannngasse 4  
A-1040 Vienna  
Austria

Tel: +43-1-58804-0  
Fax: +43-1-586-9185  
E-mail: congress@mondial.via.at

Please print in block letters or type. Please mark where appropriate with ☒



# Call for Papers

Scientists of all nations are invited to participate in the General Assembly and to submit abstracts of their oral, poster or video contributions and, by invitation, short but self-contained summaries of their presentations for publication in the conference proceedings journal *Physics and Chemistry of the Earth*. Abstracts should be typed in English and prepared in the format as described in the enclosed sample abstract: **12.0 cm width x 10.5 cm height**, single spaced and all lines flush left; title in capital letters (bold), blank line, authors and affiliation block, blank line, text; use type size not smaller than 10 pp and metric (SI) symbols typed in or drawn in dark ink.

Below the abstract authors must provide full name and address incl. telephone, fax & e-mail number of the person to whom all correspondence should be addressed, the session for which their contribution is intended, the name of the corresponding Convener, any extra equipment required for presentation and their preference for oral, poster or video presentation.

## Submission of Abstracts

**The original of the abstract must be submitted to the EGS Office and a copy to the relevant Convener. Deadline for the receipt of abstracts is 15 December 1996!**

In general, abstracts should be submitted in **hard copy, camera-ready** format. Alternatively, authors may e-mail their abstracts plus their submittal information as an ASCII (text only abstracts) or PostScript  $\leq$  Level 2 (abstracts with equations and formulas) file directly to the EGS Office. Authors using the LaTeX Macro Package for generating their abstracts, may also submit their LaTeX files via e-mail to the EGS Office.

## Reviewing Procedure and Notice of Status of Contribution

Abstracts are reviewed by the relevant Conveners, who decide about acceptance or rejection or transfer of a contribution to another Session, classify the contributions received into Oral, Poster and Video Sessions based on the information provided by the authors and arrange the papers in each Session in the order of their presentation (Session Programme Overview).

Abstracts of authors who have applied for financial support will be reviewed particularly carefully with regard to their excellence and importance to the scientific session in question.

The recommendations by the Conveners will be forwarded to the EGS Office, which will send a Notice of Status of the contribution to the person to whom all correspondence should be addressed preferentially by electronic mail or telefax. Normally, this message also includes a notice of status of financial support to all grant applicants with the request to confirm participation in the General Assembly, in particular by those that will not receive financial support.

It is expected to send these Notices of Status around **15 January 1997** or about 3 months prior to the conference - sufficient time for authors to secure fundings for their travel and their participation in the conference.

Abstracts of accepted contributions are included free of charge in the Abstract Book of the General Assembly, the Supplement Issue of the Society's journal *Annales Geophysicae*, Volume 15, 1997, to be distributed to the conference participants.

## Compilation of Programme and Notice of Final Status and Schedule of Contribution

### Programme Committee

The Programme Committee consists of the Vice-Presidents of the 8 Scientific Sections of the Society. The Programme Committee defines the overall time schedule of the meeting and accomplishes the allocation of the individual sessions with regard to the lecture rooms, poster areas and video theatres on the basis of the contributions finally accepted for each session.

### Session Programmes

On the basis of the decisions of the Programme Committee the EGS Office compiles a draft programme for each Session separately and sends it to the relevant Convener for final inspection/approval. The Convener will finalize the programme by organizing/re-organizing the Oral, Poster and Video Sessions, by including/re-arranging solicited papers and by appointing chairpersons for the various sub-sessions.

### Notice of Schedule

Based on the final decisions of the Conveners, the EGS Office will inform the person to whom all correspondence should be addressed about the final status and schedule of their contribution. These notices will be mailed by TNT Mailfast around **28 February 1997**. The corresponding contributions will be referenced free of charge in the Programme Book of the General Assembly, the Society's bulletin *Newsletter Number 62*, to be distributed to the conference participants.

### Important Remark

After having scheduled a contribution in the conference programme, it is expected that either the corresponding author or at least one of his/her co-authors will attend the meeting personally to present the paper. Empty poster boards and non-attendance in the oral sessions disrupts the programme and is extremely annoying for all those present.

### Late Papers

Contributions forwarded after 1 March 1997 cannot be included in the Programme Book anymore. However, if they are accepted by the corresponding Conveners before 14 April 1997, they will be included in the Daily Programme either as stand-by-paper or as normal paper, if another contribution has been cancelled in the meantime.

### Daily Programme

Enlarged copies (A3) of the sessions' programmes will be posted, day-by-day, outside their corresponding lecture

rooms. Any last minute changes concerning the re-ordering in time, the cancellation or the inclusion of presentations will be notified on these placards. Members of the Organizing Committee, Chairs or speakers are required to contact the congress staff members well in advance for any remarks/changes/additions.

## **Oral Presentations**

### **Lecture Rooms**

Oral presentations are organized in Oral Sessions scheduled in specific lecture rooms given in the programme together with the time of presentation of each contribution (start time).

In general, each lecture room is equipped with two overhead projectors, one slide projector, a flip chart or blackboard, spare transparencies, with markers/felt pens on a speaker's desk. In addition, there is one large screen or two separate screens to allow for double projection at any time.

One projectionist will be present in each lecture room. He/she will accept and show the slides and help the chairperson and the speakers.

In general, 15 min. are reserved for contributed and 25-30 min. for solicited papers, including discussions and change over.

### **Slides**

Speakers intending to show slides during their presentation, must deliver them clearly marked (name, sequence number and thumb mark) to the corresponding projectionist well before the beginning of the respective session.

All slides will be projected by special slide projectors from the back of each lecture room. Speakers should therefore prepare their slides to withstand the heat. Otherwise they should contact the conference staff for re-framing their slides in special glass.

### **Additional Poster or Video Presentation**

Authors are invited to extend/support their oral contributions by presenting, in addition, a poster and/or a video demonstration. Corresponding papers will be scheduled accordingly in the Poster and/or Video Sessions in the conference programme. Authors should include an appropriate notice in the submittal information of their abstract.

### **Oral Introduction of Poster or Video Papers**

Conveners may ask authors of (certain) poster or video papers of their Session to provide a short, 2-5 min. introduction of their contribution during their Oral Session. The corresponding papers will be scheduled in the conference programme and the authors will be notified accordingly.

## **Poster Presentations**

### **Poster Areas**

Poster presentations are organized in Poster Sessions, and Poster Sessions belonging thematically to the same overall topic are organized in separate Poster Areas given in the

programme and located at or nearby attractive places in the Congress Centre such as the exhibition, the refreshment stands or the general meeting areas. Authors are encouraged to submit poster papers, since poster sessions minimize clashes caused by the many parallel sessions and since there is more time reserved for the presentation and for the viewing of poster papers than for oral ones. In general, 30-40% of all contributions at an EGS General Assembly are poster contributions.

### **Poster Boards**

In general, for each poster paper one numbered poster board is reserved with a clear dimension of 100 cm (width) x 250 cm (height). All the material necessary for attaching the poster to the poster board is available in the respective poster area. In addition, there are assistants to help authors in putting up or in taking down their posters.

The number of each poster paper and of its corresponding poster board is given in the appropriate session programme at the left hand side of the author(s)-and-title block of each contribution. The first part of this number indicates the index of the corresponding Poster Area and the second part the running number of the appropriate poster board in that area.

### **Display Time**

In general, the time for the display of all posters is from Monday, 14.00, to Friday, 13.00, i.e., practically the entire week of the conference. Therefore, authors are kindly asked to put up their posters as soon as possible after their arrival at the conference and to take them down as late as possible. In this way conference participants are able to view the posters at any time during the conference hours.

### **Authors in Attendance Time(s)**

the Authors in Attendance Time(s) is (are) the time(s) when the respective authors of a Poster Session must be present at their display for presentation. In general, during this (these) time(s), the Chairperson of the corresponding Poster Session guides the group of participants from poster to poster, in order to guarantee that each author has the opportunity to present his/her poster. The Authors in Attendance Time(s) for each Poster Session is provided in the conference programme.

## **Video Presentations**

### **Video Lecture Theatre(s)**

There is a special Video Lecture Theatre with trained assistants nearby the Poster Area(s) for showing videos to a larger audience of 20-40 attendees. This theatre is equipped with an overhead projector for introductory purposes and a special projector with a video recorder for projecting the images onto a larger screen. Only VHS is available.

### **Video Sessions**

Authors are encouraged to submit video contributions, which will be organized in Video Sessions in close connection in time with the corresponding Poster Sessions. For planning purposes, the authors are kindly asked to provide

an estimate about the duration of their presentation, including an introduction and a discussion part, together with the submittal information of their abstract. In general, the Chairperson will guide the audience into the respective video theatre after or before the viewing of the posters.

Detailed information is provided in the Conference Programme, including the location of the theatre and the day and time of presentation.

### **Paper Identification Number**

Accepted and scheduled contributions of Sessions for which the publication of proceedings is foreseen by the relevant Conveners will carry their own manuscript identification numbers. These are included in the programme at the left hand side of the corresponding author(s)-and-title block and in the Notice of Final Status and Schedule Letter. The first part of this number indicates the index of the corresponding Session and the second part the running number of the appropriate paper in the Session. This identification number is for reference purposes.

### **Instructions to Speakers**

Please be in your lecture room at least 10 min **before** your session starts. Prepare your slides with your name, a sequence number and a thumb mark before delivering them to the projectionist. Each projectionist will have a copy of the programme. Please inform him or her on the position of your presentation.

If you intend to present a video paper, please contact the technical staff at the Video Lecture Theatre well in advance. It is highly recommended to perform a test-run before your actual presentation.

Since the posters may be on display for the entire week of the conference, please make sure to put your poster up as soon as possible after your arrival at the conference and to take it down as late in the week as possible. Use only the board(s) actually allocated for your poster, and please be at your display for presentation during the Authors in Attendance Time(s) given in the conference programme.

### **Guidelines for Chairpersons**

Speakers/authors may be nominated as Chairperson of a particular sub-session of a scientific session by the appropriate Convener(s). In order for the European Geophysical Society to maintain the quality of its scientific programmes, it is essential that the Chairpersons of the EGS Sessions carry out their functions properly. Below please find a brief description of these functions:

### **Conducting the Session**

The Chairperson is responsible for conducting the session. S/he is expected to open and close the session on time and to ensure that the speakers of the session are present and that they are able to make their presentations without disruption. All times allocated for presentations include also the time for discussions and change over!

### **Verification of Presenting Authors**

Before each presentation the Chairperson should verify that the person to speak is listed in the programme as one of the authors. If this is not the case and the person to speak is not sufficiently acquainted with the work in order to answer questions, only the title of the paper should be read.

### **Time Schedule**

In view of the many parallel sessions, the time schedule of the session should be strictly kept. Any disruption is extremely annoying for those wishing to attend only selected presentations. Therefore, if a gap should occur in the time schedule and no stand by paper is available to fill in, discussions on the previous talks or short oral introductions of poster papers, if not foreseen in the programme, should be stimulated.

### **Programme Changes**

Any programme changes received by the EGS Office after the Programme Book has been forwarded to the printer will be included in the "Daily Programme": a copy of the revised session programme enlarged to the size of A3 and put up outside of the corresponding lecture room in the morning before the session starts. The Chairperson will receive her/his copy from the projectionist, and s/he is kindly asked to return it after the session. Any last minute modifications should be noted on these programmes by the Chairperson.

### **Poster Sessions**

Chairpersons for poster sessions should gather and guide the audience from poster to poster in the order of their appearance, and they should invite the authors to present their posters for about 10-15 min. and stimulate discussions for about 5-10 min. afterwards.

### **Video Sessions**

Chairpersons for video sessions should gather and guide the audience from the lecture room or the poster area into the respective video lecture theatre and conduct the session in the same way as for an oral one.

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## **Invitation to the Open Section & IWG Meetings Tuesday, 22 April, 1997, 17.00**

Scientific Programme for EGS98 • Candidates for Vice-President & Council 1998-2000 • Candidates for EGS Awards & Section Medals • Nomination of Secretaries, Editors & other officers as required

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## EGS Abstract Format

12.0 cm (width) x 10.5 cm (height)

### TECHNIQUES FOR THE PREPARATION OF ABSTRACTS, SLIDES AND POSTERS FOR EGS MEETINGS

I.C. Nemo (Institut für Meteorologie und Geophysik, Schöpfstr. 41, A-6020 Innsbruck, Austria)

J. Verne and A.N. Other (ETH, Sonneggstr. 5, CH-8006 Zürich, Switzerland)

Follow this example in preparing your abstract in hard-copy, camera-ready format. Abstracts that do not meet this format or that are without submittal information will **not** be processed! Use a laserprinter or a good typewriter with a plastic carbon ribbon. Since there will be a 69 % size reduction, do not use a type size smaller than 10 pica points. **Type all lines flush left:** (1) Type title of contribution in capital letters and in bold (optional). (2) Leave one blank line after the title block. (3) Type first author(s) followed directly by corresponding affiliation. Additional author(s) should be typed similarly, without blank lines between authors. Underline or "bold" the name of the author who will present the paper. (4) Leave one blank line after the author block. (5) Type text of abstract flush left. (6) Mathematical symbols should be typed in or drawn neatly in dark ink. (7) Metric (SI) symbols should be used. (8) Abstract size block should be drawn only on typing backup sheet. (9) Be sure to complete all submittal information. (10) Contact WWW or the EGS Office for the abstract LaTeX macro package. (11) Mail the original to the EGS Office and a copy to the appropriate Convener(s). Alternatively, use e-mail and send the original plus your submittal information as an ASCII, PS or LaTeX File directly to the EGS Office. (12) Prepare your slides with your name, a sequence number and a thumb mark, and hand them to the projectionist in your lecture room before your Session starts. (13) The size of the poster boards for EGS97 is 1 m (width) x 2.5 m (height). (14) Videos (VHS) will be organized in a separate room near poster areas.

### Submittal Information (Type the following information in this position on your abstract)

1. Name, full address and telephone, fax & e-mail number for correspondence
2. Reference of Session for which your contribution is intended
3. Name(s) of Convener(s) to whom a copy of your abstract has been sent
4. Projection or other equipment if required in addition to standard (\*)
5. Preference for oral, poster or video presentation
6. Name of EGS Support Award if applied for

(\*) Two overhead and one slide projector per lecture room is standard and simultaneous projection possible, one poster board of 1 m (width) x 2.5 m (height) per poster paper, and professional VHS projection facilities in a separate room near the poster areas.

### Send Original to EGS Office & Copy to appropriate Convener(s) before 15 December 1996:

EGS Office  
Max-Planck-Str. 1  
37191 Katlenburg-Lindau  
Germany

Tel: +49-5556-1440  
Fax: +49-5556-4709  
SPAN: NSP::LINMPI::EGS  
INTERNET: EGS@LINAX1.MPAE.GWDG.DE  
<http://www.mpaе.gwdg.de/EGS/EGS.html>

# EUROPEAN GEOPHYSICAL SOCIETY



## Young Scientists' Travel Awards

### Conditions

These awards are intended to assist young European scientists to attend the General Assemblies of the Society by

- |   |  |
|---|--|
| ☆ providing a financial support<br>to their travel expenditures<br>of max. 500 CHF (Swiss Francs) | ☆ waiving their registration fees<br>for the EGS meeting |
|---|--|

To qualify for an award the applicant must:

1. Normally be less than 30 years old on 31 December of the year of the EGS meeting concerned, although this age limit may be extended slightly to accommodate a student's period of training;
2. Intend to present a paper at the Society's meeting, of which he or she is the principal author;
3. Secure a written statement of support of this application from his or her research supervisor or department head, or from a full member of the European Geophysical Society;
5. Submit the completed application form together with the abstract to the EGS Office by the deadline date and a copy to the appropriate Convener(s).

Applications will be reviewed by the appropriate Convener(s) in view of the excellence and importance of their contributions, and final selections will be made by the Programme Committee on behalf of the Council. The number of awards granted will depend on the funds reserved for this support scheme. Successful applicants will receive their contribution at their arrival at the General Assembly. All applicants will be informed by the Society about the outcome of their applications. For faster communication, please provide your telefax, telex or e-mail number.

All abstracts will be included free of charge in the Book of Abstracts of the General Assembly, irrespectively of the outcome of the respective applications.

**Please submit the application before 15 December with a copy to the appropriate Convener(s) to:**

EGS Office  
Max-Planck-Str. 1  
37191 Katlenburg-Lindau  
Germany

Tel: +49-5556-1440  
Fax: +49-5556-4709  
INTERNET: EGS@LINAX1.MPAE.GWDG.DE



# Application for a Young Scientists' Travel Award

(please return only this form together with the abstract)

I wish to apply for an award to attend the forthcoming General Assembly of the European Geophysical Society

in ..... from ..... to .....

Name ..... Title: Dr./Mr./Mrs./Miss/Ms.

Address .....

.....

Telephone: ..... Telefax: ..... E-Mail: .....

Date of birth: Year ..... Month ..... Day .....

Studying at .....

Academic qualifications .....

I wish to present a paper entitled .....

.....

to the Session entitled: .....

.....

I estimate the cheapest return fare to the EGS meeting is CHF ..... (please give estimate in Swiss Francs).

**Note:** Awards will not necessarily cover the whole cost of travel and the maximum award possible is CHF 500.

Please attach the abstract of the paper you wish to present in the standard format laid down in the call for papers.

Date ..... Signed .....

**Statement of support:** I support the application for an award to enable this young scientist to attend the forthcoming General Assembly of the European Geophysical Society for the following reasons:

.....

.....

.....

.....

Name ..... Title: .....

Address .....

.....

Date ..... Signed .....

# EUROPEAN GEOPHYSICAL SOCIETY



## Keith Runcorn Travel Awards

### Conditions

These awards are intended to assist a **limited number** of young American scientists to attend the General Assemblies of the Society by

- |   |  |
|---|--|
| ☆ providing a financial support<br>to their travel expenditures<br>of max. 500 US\$ | ☆ waiving their registration fees<br>for the EGS meeting |
|---|--|

To qualify for an award the applicant must:

1. Normally be less than 30 years old on 31 December of the year of the EGS meeting concerned, although this age limit may be extended slightly to accommodate a student's period of training;
2. Intend to present a paper at the Society's meeting, of which he or she is the principal author;
3. Secure a written statement of support of this application from his or her research supervisor or department head, or from a full member of the European Geophysical Society;
5. Submit the completed application form together with the abstract to the EGS Office by the deadline date and a copy to the appropriate Convener(s).

Applications will be reviewed by the appropriate Convener(s) in view of the excellence and importance of their contributions, and final selections will be made by the Programme Committee on behalf of the Council. The number of awards granted will depend on the funds reserved for this support scheme. Successful applicants will receive their contribution at their arrival at the General Assembly. All applicants will be informed by the Society about the outcome of their applications. For faster communication, please provide your telefax or e-mail number.

All abstracts will be included free of charge in the Book of Abstracts of the General Assembly, irrespectively of the outcome of the respective applications.

**Please submit the application before 15 December with a copy to the appropriate Convener(s) to:**

EGS Office  
Max-Planck-Str. 1  
37191 Katlenburg-Lindau  
Germany

Tel: +49-5556-1440  
Fax: +49-5556-4709  
INTERNET: EGS@LINAX1.MPAE.GWDG.DE

# Application for a Keith Runcorn Travel Award

(please return only this form together with the abstract)

I wish to apply for an award to attend the forthcoming General Assembly of the European Geophysical Society

in ..... from ..... to .....

Name ..... Title: Dr./Mr./Mrs./Miss/Ms.

Address .....

.....

Telephone: ..... Telefax: ..... E-Mail: .....

Date of birth: Year ..... Month ..... Day .....

Studying at .....

Academic qualifications .....

I wish to present a paper entitled .....

.....

to the Session entitled: .....

.....

I estimate the cheapest return fare to the EGS meeting is US\$ ..... (please give estimate in US Dollars).

**Note:** Awards will not necessarily cover the whole cost of travel and the maximum award possible is US\$ 500.

Please attach the abstract of the paper you wish to present in the standard format laid down in the call for papers.

Date ..... Signed .....

**Statement of support:** I support the application for an award to enable this young scientist to attend the forthcoming General Assembly of the European Geophysical Society for the following reasons:

.....

.....

.....

.....

Name ..... Title: .....

Address .....

.....

Date ..... Signed .....

# EUROPEAN GEOPHYSICAL SOCIETY



## East European Support Awards

### Conditions

These awards are intended to assist scientists from countries of central and east Europe, in particular from the former Soviet Union, to attend the General Assemblies of the EGS.

Each award includes the payment of local travel expenses (optional), of the conference fee, of the hotel/accommodation expenditures, of a modest amount of money for daily expenses, and of the health insurance (when necessary).

To qualify for an award the applicant must:

1. Intend to present a paper at the Society's meeting, of which he or she is the principal author;
2. Secure his or her own travel arrangements to the meeting or, at least, to that local, international site being closest to the location of the Assembly;
3. Submit the completed application form together with the abstract of his or her paper to the EGS Office by the deadline date and a copy to the appropriate Convener(s).

Applications will be reviewed by the appropriate Convener(s) in view of the excellence and importance of their contributions and final selections will be made by the Programme Committee on behalf of the Council. The number of awards granted will depend on the funds reserved for this support scheme. Successful applicants will receive their contribution at their arrival at the General Assembly. All applicants will be informed by the Society about the outcome of their applications. For faster communication, please provide your telex or e-mail number. For positive applicants the EGS will send a letter of invitation to the appropriate embassy, in case a visa is required.

All abstracts will be included free of charge in the Book of Abstracts of the General Assembly, irrespectively of the outcome of the respective applications.

**Please submit the application before 15 December with a copy to the appropriate Convener(s) to:**

EGS Office  
Max-Planck-Str. 1  
37191 Katlenburg-Lindau  
Germany

Tel: +49-5556-1440  
Fax: +49-5556-4709  
INTERNET: EGS@LINAX1.MPAE.GWDG.DE

# Application for an East-European Support Award

(please return only this form together with the abstract)

I wish to apply for an award to attend the forthcoming General Assembly of the European Geophysical Society

in ..... from ..... to .....

Name: ..... Title: Prof./Dr./Mr./Mrs./Miss/Ms.

Address: .....

.....

Telephone: ..... Telefax: .....

E-Mail: ..... Telex: .....

**Please, provide under all circumstances a Telex or E-Mail Number for faster communication! Otherwise your application will not be processed!**

I wish to present a paper entitled: .....

.....

.....

to the Session entitled: .....

.....

Please attach the abstract of the paper you wish to present in the standard format laid down in the Call for Papers.

☐ I have informed the appropriate Convener(s) ☐ Yes ☐ No

☐ I may receive financial support from another national/international organization ☐ Yes ☐ No

☐ EGS may on my behalf apply for a grant at the International Science Foundation (ISF) ☐ Yes ☐ No

I have secured / will secure my own travel arrangements

☐ directly to the meeting site ☐ to the following international site closest to the location of the Assembly .....

Applicants that are not able to secure their own travel arrangements directly to the meeting or, at least, to a local, international site close to the location of the Assembly will not be considered for an award.

I expect to arrive by: Car ..... Train ..... Plane .....

I expect to arrive on: ..... in .....

I expect to depart on: ..... from .....

Date ..... Signed .....



# Conference Publications

## Book of Abstracts

Traditionally all abstracts of contributions submitted to a General Assembly will be included free of charge in the Book of Abstracts, once they have been accepted by the appropriate Convener(s). This includes also papers of authors who most likely will be unable to participate in the meeting because of financial restrictions.

Moreover, in order to guarantee a wider circulation, the Book of Abstracts is published as a supplement of the Society's journal *Annales Geophysicae*.

In this way the Book of Abstracts has become an open forum for fast distribution of results of geophysical research on a pan-European, international level.

The abstracts of the various symposia are compiled in three separate parts:

Part I: Society Symposia, Solid Earth Geophysics, Geodesy and Natural Hazards.

Part II: Oceans & Atmosphere, Hydrological Sciences and Nonlinear Processes in Geophysics.

Part III: Solar-Terrestrial and Planetary & Solar System Sciences.

Abstracts of symposia sponsored by two different Sections are included twice in the appropriate chapters or volumes, respectively. Participants that have registered at the full meeting rate will receive **one part** of their choice together with the registration material.

## Proceedings

### General Information

Since 1995 the EGS publishes conference proceedings in form of short but self-contained and refereed communications of 4-6 camera-ready pages for contributed and 10-12 camera-ready pages for solicited papers including figures and tables at no page or handling charges and 25 free off-prints for authors. Papers will be published in thematic issues, which will be made available to authors and EGS members at special discount rates of 15.00 Pounds Sterling per issue. The journal for the publication of these proceedings is *Physics and Chemistry of the Earth* published by Pergamon-Elsevier, Oxford, UK.

Solicited papers published in the conference proceedings may not be published elsewhere. Contributed papers, however, may be published in an extended form elsewhere.

**Attention: Only papers actually presented and submitted at the EGS conference and belonging to a Session for which the publication of proceedings is foreseen are eligible for publication in the proceedings journal!**

### Guidelines for Conveners intending to publish Proceedings

The publication of proceedings of a session is at the discretion of the appropriate Convener(s)! However, once Conveners have decided to publish proceedings, the following tasks have to be accomplished:

1. Conveners have to inform the EGS Office accordingly, at the latest when returning their Session Overviews (10 January 1997). The EGS Office will then include an appropriate statement in the Notice of Status of Contributions sent to the corresponding authors.
2. Conveners have to nominate Editors, at the latest when returning their Draft Session Programmes (21 February 1997). Authors will then be informed by their Letter of Acceptance and Schedule that proceedings are definitely foreseen, and they will receive the Guidelines for Manuscripts for Conference Proceedings. In case Conveners will not provide a complete list of Editors by the above deadline, the publication of proceedings will be annulled.
3. Conveners may serve as Editors and/or Referees, however, not of papers of which they are authors or co-authors.

The names of the Session Editors are automatically forwarded to the respective Topical Editor of the proceedings journal *Physics and Chemistry of the Earth*.

### Guidelines for Authors intending to publish Proceedings

In general, authors have been informed whether the Conveners of their Session foresee the publication of proceedings.

In case proceedings of their session will be published, it is at the discretion of the author(s) of that session as to whether or not he/she/they wish to submit a paper. Authors wishing to submit a paper should consider the following instructions:

1. Contributions should be short but self-contained, concentrating on new results or techniques, and they should be type-written double-spaced, on one side of a page only, and with a wide 3-5 cm margin on the right. The final version of a contributed paper should not exceed 4-6 camera-ready pages and of a solicited paper not more than 10-12 pages, including tables, appendices and references.
2. Papers should be clear, concise, and written in English with correct spelling and good sentence structure. Correct English is the responsibility of the author, although the editor and the referees are kindly asked to help in language editing of the manuscript if necessary.
3. Each manuscript should be prepared in accordance with the technical instructions provided with their Letter of Acceptance and Schedule of their contribution.
4. There is a LaTeX Macro Package available on WWW or from the EGS Office for compiling both the manuscript as well as the hard copy, camera-ready version.

5. Authors must submit 4 copies of their manuscript to the **General Assembly's Editorial Office**, where these copies will be distributed to the editor(s) and referees in question. Each copy must carry its Manuscript Identification Number (MS-No.), which is included in the Session Programme. Manuscripts submitted after the conference will not be considered for publication!
6. After the refereeing process each author will be informed by the Session Editor(s) as to whether or not his/her paper is accepted for publication. In case a manuscript is accepted for publication, the respective author is asked to consider the referees' comments and to provide the final version in hard copy, camera-ready form in accordance to the guidelines which, as well as the offprint and special issue order forms, will be included in the Programme Book or are available on WWW or from the EGS Office.
7. Authors will receive 25 free off-prints of their article.
8. Additional offprints and/or the respective session issue of the proceedings journal should be ordered when returning the final camera-ready manuscript.

#### **Guidelines for Session Editors of Conference Proceedings**

Session Editors are appointed by the Programme Committee or by the Session Conveners and Co-Conveners. Session Editors serve and appear as guest editors of their session issue of the proceedings journal.

Session Editors are responsible (1) to nominate appropriate referees prior, at or shortly after the EGS conference and to inform the EGS Office accordingly; in general there should be two independent referees per paper, whereby the Editor may serve as one of the two referees; (2) to pick up the copies of the manuscripts of their session together with the respective Reviewer's and Editor's Report forms at the **General Assembly's Editorial Office**; (3) to distribute the copies and the forms amongst the referees selected; (4) to monitor the deadline for returning the reviewers' reports; (5) to evaluate the manuscripts; and (6) to submit **by the deadline date** their completed reports to the EGS Office and copies together with the respective suggestions and comments of the referees to the authors.

Since authors or co-authors must attend the conference to present and to submit their paper, they must be in possession of the Programme Book and thus of the Guidelines for preparing manuscripts in final, camera-ready form.

Papers, which are not evaluated within reasonable limits of the deadline date, will not be included in the Session Issue but rather in the final General Issue.

#### **Guidelines for Session Referees of Conference Proceedings**

Session Referees are appointed by the respective Session Conveners, Co-Conveners and Editors on behalf of the Programme Committee. Normally, they are selected from the speakers or authors of a Session to serve as reviewer of papers of which they will not be a speaker or author themselves.

Referees are responsible (1) to assure the receipt of the articles together with the respective Reviewer's Report form, for which they have been nominated to serve as reviewer; these papers may be provided either at the **General Assembly's Editorial Office** or by the corresponding Editor afterwards; (2) to evaluate the papers; and (3) to submit **before the deadline date** the completed Report forms to the Editorial Office and copies together with their comments and suggestions (either on a separate sheet or directly in the manuscript) directly to their appropriate Editors.

Editors serving as referees should also proceed as outlined above.

The submission of the reviewer's reports will be monitored, paper-by-paper, by the EGS Office. To assure that deadlines are kept within reasonable limits, additional referees may be appointed by the Editorial Office.

Session Referees are encouraged to contact the authors of the papers to be reviewed during the conference.

#### **EGS Journals**

Following the tradition of other leading scientific organizations, the EGS expects that authors should consider the Society's journals for the publication of their contribution to the EGS General Assembly in an extended form.

All journal papers undergo rigorous peer review and careful copy-editing by competent colleagues prior to publication.

There are no page nor handling charges and reprints are, in general, free for authors in all EGS journals. Rapid publication and distribution worldwide, moderate library subscription rates and greatly reduced membership subscription rates are guaranteed.

##### ***Annales Geophysicae (12 issues per year)***

The leading interdisciplinary, boundary-layer journal covering the physics and chemistry of the oceans, of the lower, middle and upper atmosphere of the Earth, of the Sun and of the interplanetary medium, as well as the marine boundary layer and the air-sea interface, the interface between the atmosphere and the biosphere, lithosphere, hydrosphere, ionosphere and magnetosphere and the interaction at solar-terrestrial boundary layers.

Please send your manuscript to:

Mrs. Sylviane Perret	Tel.: +33-61-558370
Editorial Assistant AG	Fax: +33-61-556535
CESR-CNRS-UPS	anngeo@cesr.cnes.fr
B.P. 4346	
31029 Toulouse Cedex	
France	

##### ***Climate Dynamics (8 issues per year)***

Welcomes papers containing original diagnostic, analytical or numerical modeling research on the structure and behavior of the atmosphere, oceans, cryosphere, biomass and land surface as interacting components of the dynamics of global climate as well as contributions focused on selected aspects of climate dynamics on particular scales of space or time.

Please send your manuscript to:

Dr. Lydia Dümenil  
MPI für Meteorologie  
Bundesstr. 55  
20146 Hamburg  
Germany  
Tel.: +49-40-41173-310  
Fax: +49-40-41173-366  
dumenil@dkrz.d400.de

**Geophysical Journal International** (12 issues per year)  
Covers all disciplines of the physics and chemistry of the solid earth.

Please send your manuscript to:

Prof. Roberto Sabadini  
Dept. of Earth Sciences  
Section of Geophysics  
Universita di Milano  
via L. Cicognara 7  
20129 Milano  
Italy  
Tel.: +39-2-2369-8400  
Fax: +39-2-7490-588  
bob@sabadini.geofisica.unimi.it

**Journal of Atmospheric Chemistry** (9 issues per year)  
The key journal for the study of the chemistry of the Earth's atmosphere with emphasis on the region below about 100 km, including also topics related to meteorology, oceanography, soil science, biology and microbiology.

Please send your manuscript to:

Editorial Office  
Kluwer Academic Publishers  
P.O. Box 17  
3300 AA Dordrecht  
The Netherlands  
Tel.: +31-78-6392-146/203  
Fax: +31-78-6391-254  
ampdejong@wkap.nl

**Journal of Geodynamics** (8 issues per year)  
The interdisciplinary journal for solid earth research in geodetic, geophysical, geological and geochemical geodynamics, with special emphasis on the large scale processes.

Please send your manuscript to:

Prof. Dr. Wolfgang R. Jacoby  
Department of Earth Sciences  
Johannes Gutenberg Universität  
Saarstr. 21  
55122 Mainz  
Germany  
Tel.: +49-6131-393-223  
Fax: +49-6131-394-769  
jacoby@mzdmza.zdv.uni-mainz.de

**Nonlinear Processes in Geophysics** (4 issues per year)  
An interdisciplinary journal published by the EGS for the publication of original research involving nonlinear processes in geophysics in the broadest sense. Contributions from both dynamical system theorists as well as geophysicists applying nonlinear methods to fundamental problems in geosciences are welcome.

Please send your manuscript to:

EGS Office  
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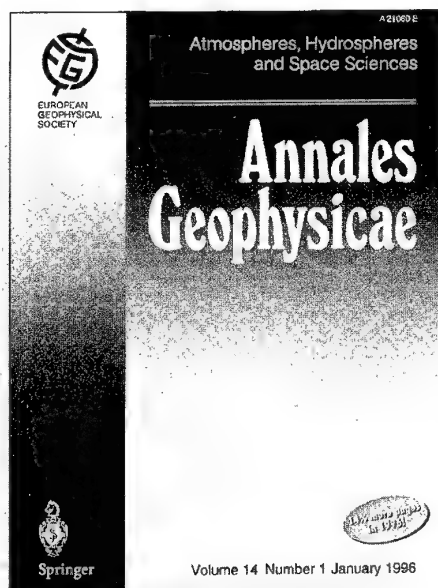
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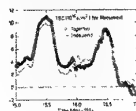
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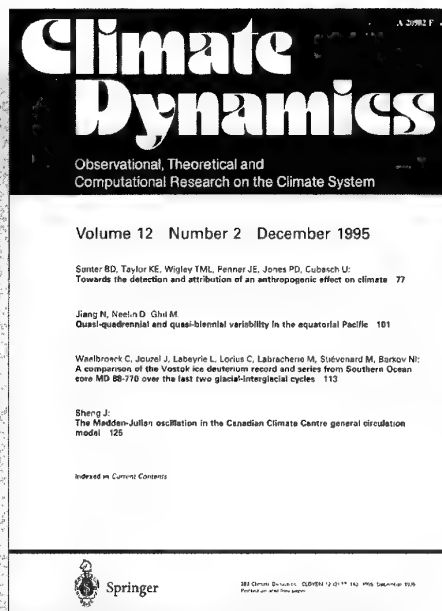
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Convener: R. Kind (Potsdam), Co-Conveners: A.W.B. Jacob (Dublin), M. Weber (Göttingen)
- SE8 Real time earthquake surveillance and hazard assessment**  
Convener: E.S. Husebye (Bergen), Co-Conveners: R. Console (Rome), C.A. Papaioannu (Thessaloniki)

- SE9 Seismic and teleseismic studies of the lithosphere**  
Convener: U. Achauer (Strasbourg), Co-Conveners: E. Perchuc (Warsaw)
- SE10 Deep seismics: methodological challenges and limitations**  
Convener: C. Prodehl (Karlsruhe), Co-Conveners: N.I. Pavlenkova (Moscow)
- SE11 Granulites-granites amalgamation in geochemical, geophysical and tectonic data (co-sponsored by EUG)**  
Convener: P. Jakes (Praha), Co-Conveners: V. Gardien (Villeurbanne)
- SE12/G13 Earth rotation and its interaction with other geophysical phenomena**  
Convener: B. Kolaczek (Warsaw), Co-Conveners: V. Dehant (Brussels), J. Hinderer (Strasbourg), H. Schuh (München)
- SE13/G9 Modelling of global change phenomena with observational geodetic and geophysical constraints**  
Convener: H.-P. Plag (Kiel), Co-Conveners: B.F. Chao (Greenbelt)
- SE14 Near-surface geophysics: archaeological prospection and archaeomagnetic dating**  
Conveners: J. Faßbinder (München), V. Hoffmann (München)
- 01 Archaeological prospection**  
Convener: A. Schmidt (Bradford), Co-Conveners: J. Faßbinder (München)
- 02 Archaeomagnetic dating**  
Convener: N. Abrahamsen (Aarhus), Co-Conveners: L. Pesonen (Espoo)
- 03 Near surface geophysics: engineering geophysics**  
Convener: S.P. Papamarinopoulos (Athens), Co-Conveners: M. Dietrich (Grenoble)
- SE15 Rock- and palaeomagnetism and environmental magnetism**  
Convener: V. Hoffmann (München)
- 01 Magnetic signature of diagenesis and weathering**  
Convener: A.J. van Velzen (Oxford), Co-Conveners: A.M. Hirt (Zürich)
- 02 Environmental magnetism with emphasis on calibration of magnetic methodology**  
Convener: F. Heller (Zürich), Co-Conveners: F. Oldfield (Bern), I. Snowball (Espoo)
- 03 Palaeomagnetism and tectonic evolution of central Europe and the Alpine region (co-sponsored by EUG)**  
Convener: H.J. Mauritsch (Leoben), Co-Conveners: J.-B. Edel (Strasbourg), E. Marton (Budapest)
- 04 Magnetic properties of minerals and rocks**  
Convener: D.J. Dunlop (Mississauga), Co-Conveners: M.J. Dekkers (Utrecht), V. Hoffmann (München)

- 05 Biomagnetic materials: basic properties and applications**  
 Convener: T. Gendler (Moscow),  
 Co-Conveners: B.A. Maher (Norwich),  
 N. Petersen (München)
- SE16/G15 Potential fields in geophysics and geodesy**  
 Convener: W.R. Jacoby (Mainz), Co-Conveners:  
 C. Braitenberg (Trieste), E. Groten (Darmstadt)
- SE17/G2 Determination of the high-resolution gravity field**  
 Convener: O. Francis (Brussels), Co-Conveners:  
 J. Hinderer (Strasbourg)
- SE18/G3 Determination of 3D crustal deformations and their geodynamic implications**  
 Convener: H. Drewes (München), Co-Conveners:  
 G. Blewitt (Newcastle-upon-Tyne)
- SE19 Plume-lithosphere interaction, geophysical anomalies and volcanism**  
 Convener: C.G. Farnetani (Paris), Co-Conveners:  
 A. Björnsson (Reykjavik), W.R. Jacoby (Mainz),  
 B.M. Naimark (Moscow)
- SE20 Satellite radar: the seafloor and geodynamics**  
 Convener: A. Cazenave (Toulouse),  
 Co-Conveners: K.M. Marks (Silver Spring),  
 W.H.F. Smith (Silver Spring)
- SE21/G16 Local, regional and global relations of gravity with other geological and geophysical fields**  
 Convener: K. Regenauer-Lieb (Auckland),  
 Co-Conveners: P. Schmidt (Hannover), E. Seidler  
 (Frankfurt/Main)
- SE22 Elastic wave velocities in rocks: anisotropy, heterogeneity and frequency effects**  
 Convener: D. Mainprice (Montpellier),  
 Co-Conveners: Y. Gueguen (Paris)
- SE23 Relationship between various properties in sedimentary and crystalline rocks**  
 Convener: E. Huenges (Potsdam), Co-Conveners:  
 I.T. Kukkonen (Espoo), J.L. Urai (Rijswijk)
- SE24/HS5.1 Estimation of transport parameters in unsaturated soils**  
 Convener: R. Haverkamp (Grenoble),  
 Co-Conveners: W. Durner (Bayreuth)
- SE25 Regional magnetic survey: data, models and charts**  
 Convener: P. Hejda (Praha), Co-Conveners:  
 M. Chiappini (Rome)
- SE26 Comparing electromagnetic studies of the crust and upper mantle: east and west of the Tornquist-Teisseyre zone**  
 Convener: A. Junge (Frankfurt/Main),  
 Co-Conveners: V. Cerv (Praha), T.M. Rasmussen  
 (Uppsala), L.L. Vanyan (Moscow)
- SE27 Tectonic evolution and thermal structure at mid-ocean ridges**  
 Convener: D. Blackman (La Jolla),  
 Co-Conveners: E. Hooft (Woods Hole),  
 T.A. Minshull (Cambridge)
- SE28 Lithospheric structure and seismicity at convergent margins**  
 Convener: E.R. Flüh (Kiel), Co-Conveners:  
 R. Carbonell (Barcelona), D. Cordoba (Madrid)
- SE29/NP1.1 Scaling, multifractals and nonlinearity in solid Earth geophysics**  
 Convener: J. Schmittbuhl (Paris), Co-Conveners:  
 P. Bak (Upton), H.J. Herrmann (Paris),  
 D.L. Turcotte (Ithaca)
- SE30 Investigation and reconstruction of pre-instrumental and historical earthquakes**  
 Conveners: R. Gutdeutsch (Wien),  
 G.A. Papadopoulos (Athens)
- III. Geodesy (G)*
- G1 Monitoring of long-term gravity variations and their reliability**  
 Convener: O. Francis (Brussels), Co-Conveners:  
 J. Hinderer (Strasbourg)
- G2/SE17 Determination of the high-resolution gravity field**  
 Convener: O. Francis (Brussels), Co-Conveners:  
 J. Hinderer (Strasbourg)
- G3/SE18 Determination of 3D crustal deformations and their geodynamic implications**  
 Convener: H. Drewes (München), Co-Conveners:  
 G. Blewitt (Newcastle-upon-Tyne)
- G4 Improvements in satellite orbit determination**  
 Convener: F. Nouel (Toulouse), Co-Conveners:  
 R. Noomen (Delft)
- G5 Remote sensing for topography and geodynamics**  
 Convener: R. Klees (Delft), Co-Conveners:  
 J.L. Bamber (Dorking)
- G6/OA6 Ocean modelling from altimetry and remote sensing**  
 Convener: P. Knudsen (Copenhagen),  
 Co-Conveners: P.Y. Le Traon (Toulouse)
- G7 Geoapplications of satellite altimetry**  
 Convener: J. Klokocnik (Ondrejov),  
 Co-Conveners: P. Moore (Birmingham),  
 C.A. Wagner (Silver Spring)
- G8 The role of geodesy in the study of global change**  
 Convener: S. Zerbini (Bologna), Co-Conveners:  
 S.M. Klosko (Greenbelt)
- G9/SE13 Modelling of global change phenomena with observational geodetic and geophysical constraints**  
 Convener: H.-P. Plag (Kiel), Co-Conveners:  
 B.F. Chao (Greenbelt)

- G10 Modelling of atmospheric parameters in geodetic observations**  
Convener: A. Dodson (Nottingham),  
Co-Convener: G. Elgered (Onsala)
- G11/OA21 Measuring and modelling atmosphere-ocean-land interactions**  
Convener: P. Gegout (Strasbourg),  
Co-Conveners: S.R. Dickman (Binghamton),  
K. Laval (Paris)
- G12 Developments in spectral stochastic techniques for gravity field modelling**  
Convener: I.N. Tziavos (Thessaloniki),  
Co-Convener: M. Vermeer (Masala)
- G13/SE12 Earth rotation and its interaction with other geophysical phenomena**  
Convener: B. Kolaczek (Warsaw), Co-Conveners:  
V. Dehant (Brussels), J. Hinderer (Strasbourg),  
H. Schuh (München)
- G14 Geodetic and geodynamic programmes of the CEI (Central European Initiative)**  
Convener: J. Sledzinski (Warsaw)
- G15/SE16 Potential fields in geophysics and geodesy**  
Convener: W.R. Jacoby (Mainz), Co-Conveners:  
C. Braitenberg (Trieste), E. Groten (Darmstadt)
- G16/SE21 Local, regional and global relations of gravity with other geological and geophysical fields**  
Convener: K. Regenauer-Lieb (Auckland),  
Co-Conveners: P. Schmidt (Hannover), E. Seidler (Frankfurt/Main)
- G17 PRARE system: performance and results**  
Convener: C. Reigber (Potsdam), Co-Convener:  
K. Aksnes (Oslo)
- IV. Hydrological Sciences (HS)*
- HS1 HS Section Lecture**  
Speaker: D. Gutknecht (Wien)
- HS2 Open session on hydrology**  
Convener: J.P. O'Kane (Cork)
- HS3 Resolving salt accumulation and its control in irrigated soils**  
Convener: J. Gowing (Newcastle upon Tyne)
- HS4 Coupling fluid flow and rock stress models for fractured rock systems**  
Convener: R. Lunn (Newcastle upon Tyne)
- HS5 Flow and transport in unsaturated soils**  
**01/ SE24 Estimation of transport parameters in unsaturated soils**  
Convener: R. Haverkamp (Grenoble),  
Co-Convener: W. Durner (Bayreuth)  
**02 Modelling the effect of heterogeneity of soil properties on flow and transport**  
Convener: S. van der Zee (Wageningen)  
**03 Soil-plant-atmosphere interactions**  
Convener: A. Lindroth (Uppsala)
- 04 Multiphase flow and transport behaviour in soil/aquifer systems**  
Convener: R. Mackay (Newcastle upon Tyne), Co-Convener: P. Grathwohl (Tübingen)
- 05 Colloids and colloid-assisted contaminant transport in soils**  
Convener: K.-U. Totsche (Bayreuth)
- 06 Frozen soils: processes and properties**  
Convener: P.-E. Jansson (Uppsala)
- 07 Biological processes in the unsaturated soil**  
Convener: A. Tietema (Amsterdam)
- HS6 Stomatal and canopy resistances in mathematical modelling of SVAT systems**  
Convener: F. Matejka (Bratislava),  
Co-Conveners: A. Lindroth (Uppsala), V. Novak (Bratislava)
- HS7/OA22 Hydrological, oceanic and atmospheric processes governing heat and mass balances at northern latitudes: experiences from NOPEX and BALTEX (Co-sponsored by BAHG)**  
Convener: S. Halldin (Uppsala), Co-Convener:  
M. Alestalo (Helsinki)
- HS8.1 Land use change and climate feedback with particular reference to the water balance of semi-arid regions**  
Convener: H.H.G. Savenije (Delft),  
Co-Conveners: A. Bronstert (Potsdam),  
U. Ulbrich (Köln)
- HS8.2 Climate change and water resources management**  
Convener: O. Behr (Wien)
- HS9/OA16 Hydrology of mountainous regions**  
Convener: R. Kimbauer (Wien), Co-Conveners:  
L.N. Braun (München), D. Gutknecht (Wien)
- HS10/OA15 The integration of meteorological model forecasts into real-time flood forecasting systems**  
Convener: M. Bruen (Dublin), Co-Conveners:  
N.R. Saelthun (Oslo), F. Siccaldi (Genova),  
E. Todini (Bologna)
- HS11 Floods: generating mechanisms and their representation in deriving frequency distributions**  
**01 Physical generating mechanisms of flood producing runoff**  
Convener: G. Blöschl (Wien)  
**02 Derivation of flood frequency distributions using rainfall runoff models**  
Convener: P.E. O'Connell (Newcastle upon Tyne)
- HS12 Soil erosion and sediment transport**  
**01 Flow and sediment transport modelling in hydrology and geomorphology using numerical methods**  
Convener: S.N. Lane (Cambridge),  
Co-Convener: P.D. Bates (Bristol)

- 02 Impacts of engineering structures on erosion and sediment yield in rivers and river basins**  
Convener: J.C. Bathurst (Newcastle upon Tyne), Co-Convener: H. Habersack (Wien)
- 03 Sediment and pollution management in lake and reservoir systems**  
Convener: D. Butcher (Preston), Co-Conveners: R.W. Duck (Dundee), J.C. Labadz (Huddersfield)
- 04 Extreme events: their role in sediment supply and transport**  
Convener: S.M. White (Zaragoza), Co-Convener: W. Sumner (Davis)
- HS13 Weather radar in urban hydrology**  
Convener: H. Andrieu (Bouguenais), Co-Convener: K. Tilford (Manchester)
- HS14 Hydrological models for agricultural catchment management**  
Convener: C. Cunnane (Galway), Co-Convener: H. Damaskova (Praha)
- HS15 Minewater pollution: prediction and remediation**  
Convener: P.L. Younger (Newcastle upon Tyne), Co-Convener: F. P. Fernandez (Oviedo)
- HS16 Hydrology and water resources in the Danube region**  
Convener: G. Blöschl (Wien), Co-Convener: J. Szolgay (Bratislava)
- HS17 Seepage from open channels**  
Convener: A.P. Blaschke (Wien)
- HS18/ NP1.2 Scaling, fractals and nonlinearity in hydrology**  
Convener: C. Onof (London), Co-Conveners: J. Olsson (Lund), T.M. Over (College Station), D. Veneziano (Cambridge)
- V. Biospheric Aspects of the Hydrological Cycle (BAHC)*
- BAHC01 Interactions and feedbacks between the atmosphere and the terrestrial biosphere**  
Convener: M. Claussen (Potsdam)
- BAHC02 Integrated biosphere atmosphere experiments: boreal and arctic region - northern Eurasia studies**  
Convener: E.D. Schulze (Bayreuth)
- BAHC03 Mountain eco-hydrology**  
Convener: A. Becker (Potsdam)
- VI. Oceans and Atmosphere (OA)*
- OA1 Open session on ocean circulation: physics of water mass transformation**  
Convener: C. Böning (Kiel), Co-Convener: S. Osterhus (Bergen)
- OA2 Open session on coastal/shelf sea dynamics**  
Convener: A. Lehmann (Kiel)
- OA3 Circulation and water mass transformation in the Mediterranean**  
Convener: A. Lascaratos (Athens), Co-Convener: M. Crepon (Paris)
- OA4 The low-latitude oceans**  
Convener: F. Schott (Kiel), Co-Convener: G. Reverdin (Toulouse Cedex)
- OA5 Modelling large scale marine systems on High Performance Computers: a challenge for hydrodynamics, ecology and scientific computing**  
Convener: J.E. Berlamont (Heverlee), Co-Convener: E.A.H. Vollebregt (Delft)
- OA6/G6 Ocean modelling from altimetry and remote sensing**  
Convener: P. Knudsen (Copenhagen), Co-Convener: P.Y. Le Traon (Toulouse)
- OA7 Continental anthropogenic impact on coastal marine sediments**  
Convener: S. Kempe (Darmstadt)
- OA8 Intercomparison and validation of the ocean-atmosphere flux fields**  
Convener: S. Gulev (Moscow), Co-Convener: K. Katsaros (Plouzané)
- OA9/ ST21 Biogenic air-sea fluxes and processes in coastal and marginal seas**  
Convener: P. Buat-Menard (Talence), Co-Convener: N.J.P. Owens (Newcastle upon Tyne)
- OA10/ ST22 Sulphur cycle in the marine atmosphere**  
Convener: K. Suhre (Toulouse), Co-Convener: H. Berresheim (Hohenpeissenberg)
- OA11/ ST19 Open session on mesoscale studies**
- 01 Mesoscale meteorology**  
Convener: G. Adrian (Karlsruhe), Co-Convener: Y. Lemaître (Issy-les-Moulineaux)
- 02 Mesoscale transport of pollutants**  
Convener: E.H. Schaller (Cottbus), Co-Convener: T. Mikkelsen (Roskilde)
- OA12/ ST18 Open session on turbulent boundary layers**
- 01 Basic turbulent studies**  
Convener: A. Petrosyan (Moscow), Co-Convener: T. Gerz (Wessling)
- 02 Studies of atmospheric surface fluxes (Co-sponsored by BAHC)**  
Convener: T. Foken (Lindenberg), Co-Convener: R. Valentini (Viterbo)
- 03 Atmospheric boundary layer studies**  
Convener: J. Hojstrup (Roskilde), Co-Conveners: U. Corsmeier (Karlsruhe), P. Seibert (Wien)
- OA13 Atmospheric convection**  
Convener: M. Hantel (Wien), Co-Conveners: J.-L. Redelsperger (Toulouse), E.H. Schaller (Cottbus), R. Steinacker (Wien)

- OA14 Numerical weather prediction**  
Convener: N. Gustafsson (Norrköping),  
Co-Conveners: B. Macpherson (Bracknell),  
J. Sunde (Oslo)
- OA15/ HS10 The integration of meteorological model forecasts into real-time flood forecasting systems**  
Convener: M. Bruen (Dublin), Co-Conveners:  
N.R. Saelthun (Oslo), F. Siccardi (Genova),  
E. Todini (Bologna)
- OA16/ HS9 Hydrology of mountainous regions**  
Convener: R. Kimbauer (Wien), Co-Conveners:  
L.N. Braun (München), D. Gutknecht (Wien)
- OA17 Glaciology of the Atlantic sector of Antarctica**  
Convener: H. Miller (Bremerhaven),  
Co-Conveners: H. Rott (Innsbruck),  
D. Wagenbach (Heidelberg)
- OA18 Physically-based snow models and their links to GCMs**  
Convener: E. Brun (St.-Martin-d'Heres)
- OA19 Snow and ice chemistry of alpine and polar regions**  
Convener: M. Kuhn (Innsbruck), Co-Conveners:  
R.J. Delmas (St.-Martin-d'Heres)
- OA20/ ST20 Storm track and cyclone variability**  
Convener: U. Ulbrich (Köln), Co-Conveners:  
P.J. Valdes (Reading)
- OA21/ G11 Measuring and modelling atmosphere-ocean-land interactions**  
Convener: P. Gegout (Strasbourg),  
Co-Conveners: S.R. Dickman (Binghamton),  
K. Laval (Paris)
- OA22/ HS7 Hydrological, oceanic and atmospheric processes governing heat and mass balances at northern latitudes: experiences from NOPEX and BALTEX (Co-sponsored by BAHG)**  
Convener: S. Halldin (Uppsala), Co-Conveners:  
M. Alestalo (Helsinki)
- OA23 Climate variability: observations and modelling**  
**01 Atmospheric and oceanic processes in climate studies**  
Convener: H. Le Treut (Paris)  
**02 Seasonal to interannual variability: tropical climate predictions**  
Convener: J.M. Slingo (Reading),  
Co-Conveners: K. Laval (Paris)  
**03 Decadal variability: North Atlantic and Arctic climate**  
Convener: M. Latif (Hamburg), Co-Conveners:  
A. Navarra (Modena)  
**04 Coupled atmosphere-ice-ocean model developments**  
Convener: S. Planton (Toulouse),  
Co-Conveners: U. Cubasch (Hamburg)  
**05 Reconstruction of past climates through modelling and observations**  
Convener: P.J. Valdes (Reading),  
Co-Conveners: G. Ramstein (Gif-sur-Yvette)
- OA24/ ST16 Solar cycles and global climate variability**  
Convener: G. Cini-Castagnoli (Torino),  
Co-Conveners: J.-C. Duplessy (Gif-sur-Yvette)
- OA25/ ST2 Open session on the middle atmosphere**  
Convener: M. Dameris (Wessling), Co-Conveners:  
B.C. Krüger (Lausanne)
- OA26 GNSS-based atmospheric profiling and imaging**  
Convener: G. Kirchengast (Graz), Co-Conveners:  
P. Hoeg (Copenhagen)
- OA27/ ST14 Global ozone**  
Convener: M.-M. Hirschberg (Freising-Weihenstephan), Co-Conveners: P. Fabian (Freising-Weihenstephan), A.A. Krivolutsky (Dolgoprudny)
- OA28/ ST23 Heterogeneous processes of ozone destruction in the stratosphere and troposphere**  
Convener: A. Wahner (Jülich), Co-Conveners:  
M.J. Rossi (Lausanne)
- OA29/ ST24 The role of vegetation emissions in tropospheric chemistry**  
Convener: B. Versino (Ispra), Co-Conveners:  
N. Hewitt (Lancaster)
- OA30/ ST15 Changes of UV-B radiation in the atmosphere**  
Convener: B.C. Krüger (Lausanne),  
Co-Conveners: E.-P. Röth (Essen)
- OA31/ ST1 Review session on solar terrestrial sciences**  
Convener: P. Fabian (Freising-Weihenstephan)
- OA32/ NP1.3 Scaling, fractals and nonlinearity in oceans and atmosphere**  
Convener: F. Schmitt (Paris), Co-Conveners:  
R.F. Cahalan (Greenbelt), G. Falkovich  
(Rehovot), V.V. Yanovsky (Kharkov)
- OA33/ NP2.1 Predictability**  
Convener: M.R. Allen (Oxfordshire),  
Co-Conveners: M.K. Davey (Bracknell)
- OA34/ NP3.1 Dynamics and transport of active and passive tracers**  
Convener: B.L. Hua (Plouzane), Co-Conveners:  
R.A. Pasmanter (De Bilt)
- OA35/ NP4.1 Nonlinear waves, instabilities and wave flow interactions**  
Convener: V.I. Shira (Moscow), Co-Conveners:  
L.A. Ostrovsky (Boulder), M.G. Velarde (Madrid)
- VII. Solar-Terrestrial Sciences (ST)*
- ST1/ OA31 Review session on solar terrestrial sciences**  
Convener: P. Fabian (Freising-Weihenstephan)
- ST2/ OA25 Open session on the middle atmosphere**  
Convener: M. Dameris (Wessling), Co-Conveners:  
B.C. Krüger (Lausanne)
- ST3 Open session on the ionosphere and thermosphere**  
Convener: D. Fontaine (Velizy)

- ST4 Open session on the magnetosphere**  
Convener: M.J. Rycroft (Illkirch)
- ST5 Open session on solar and heliospheric physics (incl. Soho)**  
Convener: R.G. Marsden (Noordwijk),  
Co-Convener: B.H. Foing (Noordwijk)
- ST6 Solar mass ejections**  
Convener: V. Bothmer (Kiel), Co-Convener: B.H. Foing (Noordwijk)
- ST7 Solar and heliospheric physics beyond 2000**  
Convener: B.H. Foing (Noordwijk),  
Co-Convener: R.G. Marsden (Noordwijk)
- ST8/ NP1.4 Nonlinear dynamics in the heliosphere: shocks, solitons and fractals**  
Convener: W.M. Macek (Warsaw), Co-Convener: E. Marsch (Katlenburg-Lindau)
- ST9 New approaches to studies of wave-particle interactions in the magnetosphere**  
Convener: M.J. Rycroft (Illkirch), Co-Conveners: L. Eliasson (Kiruna), R. Horne (Cambridge), V.Yu. Trakhtengerts (Nizhny Novgorod)
- ST10 High-latitude magnetosphere: new results from recent projects**  
Convener: M. Yamauchi (Kiruna)
- ST11 The polar ionosphere and magnetosphere**  
Convener: J.-P. Villain (Orleans), Co-Convener: J. Woch (Katlenburg-Lindau)
- ST12 Mesospheric clouds: the morphology and physics of ice in the 80-100 km height region**  
Convener: M. Gadsden (Perth), Co-Convener: A.F. Roddy (Galway)
- ST13 Ionosphere-thermosphere-mesosphere coupling**  
Convener: M.J. Jarvis (Cambridge),  
Co-Convener: A.D. Aylward (London)
- ST14/ OA27 Global ozone**  
Convener: M.-M. Hirschberg (Freising-Weihenstephan), Co-Convener: P. Fabian (Freising-Weihenstephan), A.A. Krivolutsky (Dolgoprudny)
- ST15/ OA30 Changes of UV-B radiation in the atmosphere**  
Convener: B.C. Krüger (Lausanne),  
Co-Convener: E.-P. Röth (Essen)
- ST16/ OA24 Solar cycles and global climate variability**  
Convener: G. Cini-Castagnoli (Torino),  
Co-Convener: J.-C. Duplessy (Gif-sur-Yvette)
- ST17 Pioneers in solar-terrestrial physics during the 19th and 20th centuries**  
Conveners: W. Schröder (Bremen-Rönnebeck), J. Verö (Sopron)
- ST18/ OA12 Open session on turbulent boundary layers**  
**01 Basic turbulent studies**  
Convener: A. Petrosyan (Moscow),  
Co-Convener: T. Gerz (Wessling)
- 02 Studies of atmospheric surface fluxes (Co-sponsored by BAHC)**  
Convener: T. Foken (Lindenberg),  
Co-Convener: R. Valentini (Viterbo)
- 03 Atmospheric boundary layer studies**  
Convener: J. Hojstrup (Roskilde),  
Co-Conveners: U. Corsmeier (Karlsruhe), P. Seibert (Wien)
- ST19/ OA11 Open session on mesoscale studies**  
**01 Mesoscale meteorology**  
Convener: G. Adrian (Karlsruhe),  
Co-Convener: Y. Lemaitre (Issy-les-Moulineaux)
- 02 Mesoscale transport of pollutants**  
Convener: E.H. Schaller (Cottbus),  
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- ST20/ OA20 Storm track and cyclone variability**  
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- ST21/ OA9 Biogenic air-sea fluxes and processes in coastal and marginal seas**  
Convener: P. Buat-Menard (Talence),  
Co-Convener: N.J.P. Owens (Newcastle upon Tyne)
- ST22/ OA10 Sulphur cycle in the marine atmosphere**  
Convener: K. Suhre (Toulouse), Co-Convener: H. Berresheim (Hohenpeissenberg)
- ST23/ OA28 Heterogeneous processes of ozone destruction in the stratosphere and troposphere**  
Convener: A. Wahner (Jülich), Co-Convener: M.J. Rossi (Lausanne)
- ST24/ OA29 The role of vegetation emissions in tropospheric chemistry**  
Convener: B. Versino (Ispra), Co-Convener: N. Hewitt (Lancaster)
- VIII. Planetary and Solar System Sciences (PS)*
- PS1 Planetary interiors**  
Convener: P. Lognonné (Paris), Co-Convener: T.V. Gudkova (Moscow)
- PS2 Evolution and state of surfaces, crusts and lithospheres of planetary bodies**  
**01 Venus: the emerging understanding of Earth's sister planet**  
Convener: R.S. Saunders (Pasadena),  
Co-Convener: J. Raitala (Oulu)
- 02 Mars: new efforts of understanding its evolution**  
Convener: A. Chicarro (Noordwijk),  
Co-Convener: S.W. Squyres (Ithaca)
- 03 Other planets: new results**  
Convener: P. Janle (Kiel), Co-Convener: A.T. Basilevsky (Moscow)
- PS3 Atmospheres of the terrestrial and outer planets**  
Convener: S.R. Lewis (Oxford), Co-Convener: F. Hourdin (Paris)

- PS4 Titan's atmosphere and surface: recent developments**  
Convener: A. Coustenis (Meudon), Co-Convener: F.W. Taylor (Oxford)
- PS5 Lunar exploration**  
Convener: B.H. Foing (Noordwijk), Co-Convener: H. Hoffmann (Berlin)
- PS6 Planetary magnetospheres and ionospheres**  
Convener: R. Prangé (Orsay), Co-Conveners: M.K. Dougherty (London), K. Sauer (Berlin)
- PS7 Small bodies of the solar system**  
Convener: G.H. Schwehm (Noordwijk), Co-Convener: S. Ulamec (Köln)
- PS8 Solar system radiophysics and related topics**  
Convener: H.O. Rucker (Graz), Co-Convener: C.H. Barrow (Katlenburg-Lindau)
- PS9 From laboratory studies to future space experiments**  
Convener: P. Ehrenfreund (Leiden), Co-Conveners: H. Kochan (Köln), C. Krafft (Orsay), V. Pirronello (Catania)
- PS10 Meteorites and cosmochemistry**  
Convener: E. Jagoutz (Mainz), Co-Convener: G. Kurat (Wien)
- PS11 Jupiter and its satellites: results from the GALILEO mission**  
Convener: G. Neukum (Berlin), Co-Convener: T.V. Johnson (Pasadena)

#### *IX. Nonlinear Processes in Geophysics (NP)*

- Scaling, fractals and nonlinearity**  
Conveners: S.M. Lovejoy (Montreal), D. Schertzer (Paris)
- NP1.1/ SE29 Scaling, multifractals and nonlinearity in solid Earth geophysics**  
Convener: J. Schmittbuhl (Paris), Co-Conveners: P. Bak (Upton), H.J. Herrmann (Paris), D.L. Turcotte (Ithaca)
- NP1.2/ HS18 Scaling, fractals and nonlinearity in hydrology**  
Convener: C. Onof (London), Co-Conveners: J. Olsson (Lund), T.M. Over (College Station), D. Veneziano (Cambridge)
- NP1.3/ OA32 Scaling, fractals and nonlinearity in oceans and atmosphere**  
Convener: F. Schmitt (Paris), Co-Conveners: R.F. Cahalan (Greenbelt), G. Falkovich (Rehovot), V.V. Yanovsky (Kharkov)
- NP1.4/ ST8 Nonlinear dynamics in the heliosphere: shocks, solitons and fractals**  
Convener: W.M. Macek (Warsaw), Co-Convener: E. Marsch (Katlenburg-Lindau)

- NP2.1/ OA33 Nonlinear time series analysis and chaos Predictability**  
Convener: M.R. Allen (Oxfordshire), Co-Convener: M.K. Davey (Bracknell)
- NP2.2 Nonlinear time series analysis**  
Convener: J. Kurths (Potsdam), Co-Convener: J. Stark (London)
- NP3.1/ OA34 Turbulence and diffusion Dynamics and transport of active and passive tracers**  
Convener: B.L. Hua (Plouzané), Co-Convener: R.A. Pasmanter (De Bilt)
- NP3.2 Geophysical turbulence**  
Convener: P. Read (Oxford)
- NP3.3 Vortex dynamics**  
Convener: D.G. Dritschel (Cambridge), Co-Convener: V. Zeitlin (Paris)
- NP4.1/ OA35 Nonlinear waves and natural hazards Nonlinear waves, instabilities and wave flow interactions**  
Convener: V.I. Shrira (Moscow), Co-Conveners: L.A. Ostrovsky (Boulder), M.G. Velarde (Madrid)
- NP4.2/ NH6 Coherent structure and natural hazards**  
Convener: S.S. Moiseev (Moscow), Co-Convener: L.A. Mendes-Victor (Lisboa)

#### *X. Natural Hazards (NH)*

- NH1 Prediction and management of extreme events**  
Convener: S. Tinti (Bologna), Co-Convener: B. Massinon (Bruyeres le Chatel)
- NH2 Techniques and tools for mapping natural hazards and risk impact on the developed environment**  
Convener: F. Guzzetti (Perugia)
- NH3 Seismic hazard assessment in active tectonic regions**  
Convener: J.-P. Avouac (Bruyeres le Chatel), Co-Convener: R. Console (Rome)
- NH4 Hydrology of extremes and numerical weather predictions**  
Convener: R.J. Moore (Wallingford), Co-Conveners: M.C. Llasat (Barcelona), F. Siccardi (Genova)
- NH5 Submarine landsliding**  
Convener: J.I. Svendsen (Bergen), Co-Convener: Ph. Heinrich (Bruyeres le Chatel)
- NH6/ NP4.2 Coherent structure and natural hazards**  
Convener: S.S. Moiseev (Moscow), Co-Convener: L.A. Mendes-Victor (Lisboa)
- NH7 Natural hazards in active volcanic regions**  
Convener: G. Macedonio (Pisa), Co-Convener: H.M. Mader (Bristol)



# Details of Scientific Programme

## I. Society Symposia (EGS)

### EGS1 Joint inversion as a general problem in Earth sciences

Convener: **Dr. Ludwig Ballani**, GeoForschungs-Zentrum Potsdam, Telegrafenberg A 17, 14473 Potsdam, Germany; Tel: +49-331-288-1142, Fax: +49-331-288-1111, E-mail: bal@gfz-potsdam.de  
Co-Conveners: **Prof. Zdenek Martinec**, Faculty of Mathematics and Physics, Charles University, V Holesovickach 2, 18000 Prague, Czech Republic; Tel: +42-2-8576-2539, Fax: +42-2-8576-2555, E-mail: zdenek@hervam.troja.mff.cuni.cz

**Gabriel Strykowski**, National Survey and Cadastre Denmark, Rentemestervej 8, 2400 Copenhagen NV, Denmark; Tel: +45-35-875316, Fax: +45-35-875052, E-mail: GS@KMS.MIN.DK

**Prof. Dr. Peter Weidelt**, Institut f. Geophysik und Meteorologie, TU Braunschweig, Mendelssohnstr. 3, 38106 Braunschweig, Germany; Tel: +49-531-391-5218, Fax: +49-531-391-5220, E-mail: WEIDELT@GEOPHYS.NAT.TU-BS.DE

The ambiguity of a solution is inherent in solving inverse geophysical problems based on one type of data (observables, parameters of fields and processes). To reduce this ambiguity, there is a need of including independent information obtained from elsewhere, possibly from data from other geophysical disciplines.

The scientific aim of this symposium is to discuss and to demonstrate how the information contained in data from various sources can be extracted and merged into a joint solution. The scope of the symposium includes both the methodology (i.e. how to couple inverse problems associated with different geophysical disciplines to obtain a joint solution, or in modelling), and practical applications (modelling examples, algorithms).

It is our aim to bring together geoscientists from different fields who are interested in inverse problems - in their theory, their solution and the interpretation.

### EGS2 Modelling techniques in geology and geophysics by the aid of Geoscientific Information Systems (GIS)

Convener: **Prof. Dr. Hans-Jürgen Götze**, Institut für Geologie, Geophysik und Geoinformatik, Haus N, Freie Universität Berlin, Malteserstr. 74-100, 12249 Berlin, Germany; Tel: +49-30-7792-874, Fax: +49-30-775-3078, E-mail: HAJO@ZEDAT.FU-BERLIN.DE

Co-Conveners: **Dr. Heinz Burger**, Institut für Geologie, Geophysik und Geoinformatik, Haus D, Freie Universität Berlin, Malteserstr. 74-100, 12249 Berlin, Germany; Tel: +49-30-7792-561, Fax: +49-30-775-3078, E-mail: HBURGER@ZEDAT.FU-BERLIN.DE

**Dr. Sabine Schmidt**, Institut für Geologie, Geophysik und Geoinformatik, Haus N, Freie Universität Berlin, Malteserstr. 74-100, 12249 Berlin, Germany; Tel: +49-30-7792-874, Fax: +49-30-775-3078, E-mail: SSCHMIDT@ZEDAT.FU-BERLIN.DE

In spite of efforts geologists and geophysicists made over the last years to handle space-time modelling of geological domains in the Earth's crust and mantle only a few of them did yet succeed in combining the vast amount of initial or additional information that may exist in areas to be modelled. It seems that Geoscientific Information Systems could be able to overcome many of the still existing problems by providing future possibilities even in a 3D domain. Contributions are welcome that deal with the special conditions in modelling of natural structures by 2D and 3D techniques in geology and geophysics, e.g. combinations of numerical modelling and GIS information in seismics, potential field methods, basin analysis and/or crustal balancing, rendering and interpolation of volume models; state-of-the-art systems which can image 3D bodies, visualization of both modelling results and other (non-numerical) information and handle fuzzy data sets.

### EGS3 Tectonic and integrated geophysical studies of the continental lithosphere (co-sponsored by EUG)

Convener: **Prof. Dr. Edi Kissling**, Institute of Geophysics, ETH Hoenggerberg, , 8093 Zürich, Switzerland; Tel: +41-1-633-2605, Fax: +41-1-633-1065, E-mail: KISS@TOMO.IFG.ETHZ.CH  
Co-Conveners: **Prof. Dr. E. Banda**, Institute of Earth Sciences "Jaume Almera", CSIC, Marti i Franques s/n, 08028 Barcelona, Spain; Tel: +34-3-4900552, Fax: +34-3-4110012

**Dr. Hans Thybo**, Geological Institute, University of Copenhagen, Oster Voldgade 10, 1350 Copenhagen K, Denmark; Tel: +45-35-32-2452, Fax: +45-3314-8322, E-mail: ht@seis.geol.ku.dk

This symposium will focus on understanding the structural and dynamic evolution of the lithosphere in continents and at their margins. Understanding the evolution of the continental lithosphere demands tectonic and integrated geophysical studies. Integrated interpretation of petrophysical parameters mapped by different geophysical methods lead to significantly improved images of present subsurface structure. We welcome contributions from integrative geophysical, tectonic, and geodynamic modelling studies.

## II. Solid Earth Geophysics (SE)

### SE1 Dynamics of the upper mantle

Convener: **Dr. Hermann Zeyen**, Geophysical Institute, University of Uppsala, Villavägen 16, 75236 Uppsala, Sweden; Tel: +46-18-183781, Fax: +46-18-501110, E-mail: hz@geofys.uu.se

Co-Convener: **Prof. Roberto Sabadini**, Department of Earth Sciences, Section of Geophysics, Università di Milano, via L. Cicognara 7, 20129 Milano, Italy; Tel: +39-2-2369-8400, Fax: +39-2-7490-588, E-mail: BOB@SABADINI.GEOFISICA.UNIMI.IT

Most of the geological structures and processes observed at the Earth surface seem to be controlled mainly by dynamic processes in the upper mantle, comprising lithosphere, asthenosphere and the transition zone. In order to understand the contribution of the upper mantle dynamics to plate tectonics, the driving forces and rheology have to be studied. In the last years, much progress has been made in the interpretation of geophysical and petrological data in terms of rheology and on-going as well as past processes such as subduction, small and larger scale convection, melting and lithosphere-asthenosphere interaction. This symposium is intending for summarizing the up-to-date knowledge of upper-mantle dynamics, past and present. Invited are papers concerning relevant geophysical, petrological and geochemical data analysis as well as numerical and physical modelling.

## SE2 **Earthquake source mechanics: new views in the understanding of seismic rupture processes**

Convener: **Dr. Massimo Cocco**, Istituto Nazionale di Geofisica, via di Vigna Murata 605, 00143 Rome, Italy; Tel: +39-6-518-60401, Fax: +39-6-504-1141, E-mail: cocco@ing750.ingrm.it  
Co-Conveners: **Dr. Michel Campillo**, Lab. de Geophysique Interne et de Tectonophysique, IRIGM, B.P. 53, 38041 Grenoble CX9, France; Tel: +33-76514504, Fax: +33-76514422, E-mail: campillo@lgit.observ-gr.fr; *after 18 October 1996* Tel: +33-4-76514504, Fax: +33-4-76514422  
**Dr. Torsten Dahm**, Institut für Meteorologie und Geophysik, Universität Frankfurt, Feldbergstr. 47, 60323 Frankfurt/Main, Germany; Tel: +49-69-7982-8281, Fax: +49-69-7982-3280, E-mail: dahm@geophysik.uni-frankfurt.de  
**Dr. Paul Spudich**, US Geological Survey, 345 Middlefield Road, Menlo Park, CA 94025, USA; Tel: +1-415-329-5654, Fax: +1-415-329-5163, E-mail: SPUDICH@ACADIA.WR.USGS.GOV

The purpose of this session is to discuss new horizons in understanding earthquake sources, focusing on multidisciplinary studies to interpret faulting and earthquake mechanics. Contributions describing theoretical and experimental investigations of fault constitutive laws and dynamic rupture are solicited. Special emphasis will be given to modelling observed ground motions by means of dynamically consistent rupture models. Observations and theoretical interpretations of rupture nucleation phases are invited. Papers directly connecting studies on fault interaction and earthquake triggering with theories on stress diffusion processes will be particularly welcome. The aim of the session is to compare theories and observations of earthquake ruptures to determine the state of stress and its heterogeneity on seismogenic faults.

## SE3

### **Signals of ice-sheet and glacier instability on sea level, gravity field and Earth's rotation**

Convener: **Prof. Kurt Lambeck**, Research School of Earth Sciences, Australian National University, GPO Box 4, Canberra ACT 2601, Australia; Tel: +61-6-249-5161, Fax: +61-6-249-5443, E-mail: kurt.lambeck@anu.edu.au  
Co-Conveners: **Dr. L.L.A. Vermeersen**, Dept. of Geodetic Science, Universität Stuttgart, Keplerstr. 11, 71174 Stuttgart, Germany; Fax: +49-711-121-3297

**Dr. Detlef Wolf**, Kinematics and Dynamics of the Earth, GeoForschungsZentrum Potsdam, Telegrafenberg A 17, 14473 Potsdam, Germany; Tel: +49-331-288-1140, Fax: +49-331-288-1163, E-mail: DASCA@GFZ-POTSDAM.DE

In the broad length and time spectrum of the Earth's deformation, the contributions from the growth and decay of ice sheets play an important part. Studies of these contributions yield information on the Earth's rheology and on the past and present changes in glacial ice.

The focus of this symposium will be on evidence for glacial signals in the time dependence of the Earth's gravity, shape and rotation, including sea-level. The emphasis will be on changes that have occurred in recent years and decades that have been recorded by geodetic methods, including VLBI and GPS measurements of crustal strain, perturbations in satellite orbits, satellite altimetry, gravity, and tide-gauge measurements.

Papers on recent advances in the field, including observational methods, numerical modelling and new applications are encouraged, as are papers which integrate the various approaches.

## SE4

### **Active and past subduction in the Mediterranean: observations and modelling (co-sponsored by EUG)**

Convener: **Dr. Alessandro Amato**, Istituto Nazionale di Geofisica, via di Vigna Murata 605, 00143 Rome, Italy; Tel: +39-6-51860-414, Fax: +39-6-504-1181, E-mail: amato@ing750.ingrm.it  
Co-Conveners: **Prof. Dr. Laurent Jolivet**, Dept. de Science de la Terre, Université de Cergy Pontoise, 33, Boulevard du Port, 95011 Cergy Pontoise, France; Tel: +33-1-3425-4945, Fax: +33-1-3425-4904, E-mail: jolivet@planete.net;  
**Prof. Dr. Randall M. Richardson**, Dept. of Geosciences, Bldg. 77, University of Arizona, Tucson, AZ 85721, USA; Tel: +1-520-621-4950, Fax: +1-520-621-2672, E-mail: RMR@GEO.ARIZONA.EDU

**Prof. Dr. M.J.R. Wortel**, Institute of Earth Sciences, Dept. of Geophysics, University of Utrecht, P.O. Box 80021, 3508 TA Utrecht, The Netherlands; Tel: +1-30-535074, Fax: +31-30-535030, E-mail: WORTEL@GEOF.RUU.NL

The recent evolution and the present-day setting of the Mediterranean region are strongly affected by the presence of subduction and collision processes, which have been active for several million years. Recently, many active or past

subduction systems have been recognized in several regions of the Mediterranean from a variety of studies, including geology, petrology, earthquake distribution, seismic tomography, gravity anomalies, and so on. The purpose of this session is to join experimental geological and geophysical data with models of subduction and collision, in order to reach a better understanding of past and active processes. Papers are welcome on the geologic evolution of active and recently active subduction systems and back-arc basins, on slab images obtained from earthquake distribution and seismic tomography, on the present-day deformation and state of stress of collision and subduction zones. Also, contributions are sought on results of numeric and laboratory modelling of the Mediterranean region.

#### SE5 **Physical aspects of metamorphism (co-sponsored by EUG)**

Convener: **Prof. Dr. Alexander O. Gliko**, Institute of Planetary Geophysics, Institute of Physics of the Earth, B. Gruzinskaya 10, 123810 Moscow, Russia; Tel: +7-095-254-8841, Fax: +7-095-255-6040, E-mail: STRAKHOV@DIR.IEPHYS.MSK.SU

Co-Convener: **Prof. Dr. Klaus Weber**, Institut f. Geologie und Dynamik der Lithosphäre, Universität Göttingen, Goldschmidtstr. 3, 37077 Göttingen, Germany; Tel: +49-551-39-7930, Fax: +49-551-39-9700

The main aim of this broad-scope symposium is to bring together geophysicists and geoscientists to review the recent achievements in the study of physical aspects of metamorphic processes and discuss the most hard key problems on the base of available field data, theoretical and experimental studies as well as computer modelling. The topics of the symposium are proposed to be in accordance to those problems: (I) Geological, geophysical and petrological data providing the physical background for mathematical and computer modelling; (II) Heat sources for a regional metamorphism, interpretation of isograds in terms of heat flow density and probable mechanisms of heat transfer; (III) Heat and mass transfer during metamorphism, modelling of coupled processes of mineral reactions and fluid transport; (IV) Nature of crustal permeability during the metamorphic events; (V) Effect of deformation, metamorphism and fluid transfer on the rheology and anisotropy of the lithosphere.

The invited lectures, contributing papers and poster section would be the main activities of the symposium.

We plan specially invite speakers on the problems of kinetics of mineral reactions, modelling of fluid flow in metamorphic environment, origin of granulitic rocks, nature of permeability and effect of metamorphic reactions on the lithospheric rheology.

#### SE6

#### **Earthquake precursors**

Convener: **Prof. Pier Francesco Biagi**, Physics Department, Università di Roma III, Via della Vasca Navale 84, 00146 Roma, Italy; Tel: +39-6-4991-4200, Fax: +39-6-4957-697, E-mail: BIAGI@AXCASP.CASPUR.IT

Co-Conveners: **Dr. Simon P. Kingsley**, Dept. of Electronic & Electrical Engineering, University of Sheffield, Mappin Street, Sheffield S1 3JD, United Kingdom; Tel: +44-114-282-5586, Fax: +44-114-272-6391, E-mail: S.KINGSLEY@SHEFFIELD.AC.UK

**Michel Parrot**, CNRS, Laboratoire de Physique et Chimie de l'Environnement, 3 A Avenue de la Recherche Scientifique, 45071 Orleans Cedex 2, France; Tel: +33-38515291, Fax: +33-38515291, E-mail: mparrot@cnrs-orleans.fr; *after 18 October 1996* Tel: +33--2-38515291, Fax: +33-2-38515291

The principal aim of the symposium is to investigate earthquake precursors, their measurement and methods of analysis and to identify future European collaborative research programmes. The scope of the symposium includes all empirical and statistical evidence relating precursors measurements to earthquakes. Presentations containing theoretical models attempting to explain the physical mechanisms behind precursors are particularly welcome. Contributions on instrumentation, measurement techniques and methods of data analysis are also acceptable.

#### SE7

#### **Global seismology**

Convener: **Prof. Dr. Rainer Kind**, GeoForschungsZentrum Potsdam, Telegrafenberg A 17, 14473 Potsdam, Germany; Tel: +49-331-8877-278, Fax: +49331-8877-533, E-mail: KIND@GFZ.POTSDAM.DE

Co-Conveners: **Prof. A.W. Brian Jacob**, School of Cosmic Physics, Dublin Institute for Advanced Studies, 5 Merrion Square, Dublin 2, Ireland; Tel: +353-1-662-1333, Fax: +353-1-662-1477, E-mail: BJ@CP.DIAS.IE

**Dr. Michael Weber**, Institut für Geophysik, Universität Göttingen, Herzberger Landstr. 180, 37075 Göttingen, Germany; Tel: +49-551-3974-82, Fax: +49-551-3974-59, E-mail: mhw@carl-f.uni-geophys.gwdg.de

This symposium deals with the seismic image of the entire body of the Earth and its dynamical and petrological implications (with less emphasis on the lithosphere, see symposia SE9 and SE10). The data used may come from the global network, and from arrays and local networks, which may be permanent or temporary. Papers describing developments in the methods employed to study the subject are also welcome.

#### SE8

#### **Real time earthquake surveillance and hazard assessment**

Convener: **Prof. Dr. Eystein S. Husebye**, Institute of Solid Earth Physics, University of Bergen, Allegaten 41, 5007 Bergen, Norway; Tel: +47-5558-3402, Fax: +47-5532-0009, E-mail: eystein.husebye@ifjf.uib.no

Co-Conveners: **Dr. Rodolfo Console**, Istituto Nazionale di Geofisica, via di Vigna Murata 605, 00143 Rome, Italy; Tel: +39-6-51860-417, Fax: +39-6-504-1181, E-mail: CONSOLE@ING750.INGRM.IT

**Dr. Christos A. Papaioannu**, ITSAK, P.O. Box 53, 55102 Finikas, Thessaloniki, Greece; Tel: +30-31-476-081, Fax: +30-31-476-085, E-mail: PAPAIOANNU@OLYMP.CCF.AUTH.GR

The symposium will focus on new aspects of local seismogram analysis for near real-time earthquake locations and the issuing of early warning alerts. Contributions may cover any aspect of processing of network recordings and autonomous field operations data for earthquake and nuclear monitoring and hazard assessment. Elaborations on extraction in an automatic manner of signal attributes suitable for estimating dynamic source parameters are particularly welcome. Approaches may range from refinements of classical signal detectors/phase pickers to artificial intelligence methods like pattern recognition, fuzzy logic, neural networks and genetic algorithms.

#### SE9 Seismic and teleseismic studies of the lithosphere

Convener: **Dr. Ulrich Achauer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416651, Fax: +33-88616747, E-mail: ULI@SISMO.U-STRASBG.FR; *after 18 October 1996* Tel: +33-3-88416651, Fax: +33-3-88616747

Co-Convener: **Dr. Edward Perchuc**, Institute of Geophysics Polish Academy of Sciences, ul. Ksiecia Janusza 64, 01-452 Warsaw, Poland; Tel: +48-22-361901, Fax: +48-22-370522, E-mail: PER@SEISMOL1.IGF.EDU.PL or PER@PER.IGF.EDU.PL

This symposium will focus on new active and passive seismic experiments constraining the structure and geodynamic evolution of the lithosphere-asthenosphere system in various geological regions.

The implication of P- and S-velocity distribution and of anisotropy on the composition, formation and evolution of the lithosphere-asthenosphere system should be discussed. Papers on the comparison of different tectonic environments are encouraged.

Joint interpretation and/or joint inversion for seismic data in connection with other geoscientific parameters are especially welcome.

#### SE10 Deep seismics: methodological challenges and limitations

Convener: **Dr. Claus Prodehl**, Geophysikalisches Institut, Universität Karlsruhe, Hertzstr. 16, 76187 Karlsruhe, Germany; Tel: +49-721-608-4443, Fax: +49-721-71173, E-mail: cprodehl@gpiwapl.physik.uni-karlsruhe.de

Co-Convener: **Prof. Nina I. Pavlenkova**, Institute of Physics of the Earth, B. Gruzinskaya 10, 123810 Moscow, Russia; Tel: +7-095-254-2327, Fax: +7-095-254-9088, E-mail: NINEL@PAVLENKOVA.MSK.RU

The symposium deals with methodological challenges and limitations of the interpretation of deep seismic sounding data. Emphasis is put on papers which focus primarily on the fine structure, composition or tectonics of the crust and lithospheric mantle. This includes near vertical and wide-angle seismic reflection data. Main emphasis is not put on the technical description of special methods, but on the interpretational challenges how reliable models may be achievable and where their basic limitations may be. We particularly invite contributions on seismic data interpretations dealing with wave nature analysis. Applications and comparisons of various interpretation methods on the same data set, but also new methods and their critical application on crustal and upper mantle data are welcome.

#### SE11 Granulites-granites amalgamation in geochemical, geophysical and tectonic data (co-sponsored by EUG)

Convener: **Dr. Petr Jakes**, Dept. of Geochemistry, Mineralogy and Mineral Resources, Faculty of Sciences, Charles University, Albertov 6, 12843 Praha 2, Czech Republic; Tel: +42-2-249-15472, Fax: +42-2-296-084, E-mail: JAKES@PRFDEC.NATUR.CUNI.CZ

Co-Convener: **Dr. Veronique Gardien**, Lab. de Petrologie et Tectonique - UMR 5570, Bat. 402, 6 etage, Universite de Lyon, 43, Bd du 11 Novembre 1918, 69622 Villeurbanne Cedex, France; Tel: +33-72448000, Fax: +33-72448382, E-mail: VGARDIEN@UNIV-LYON1.FR; *after 18 October 1996* Tel: +33-4-72448000, Fax: +33-4-72448382

The main scope of the symposium is to integrate geochemical, petrological, thermobarometrical, geophysical and structural data, in order to better understand the formation of granulites and granites in orogenic domains. Studies of natural examples of granulites terrains associated with granites are required in this symposium they will represent 1/3 of the presentations. This studies would include petrological, thermobarometrical and structural investigations. Experimental and geochemical (including geochronological) investigations are necessary for the understanding of both the relationships between granulites and granites and the melting reactions occurring during the granulitisation of the crust.

#### SE12/G13 Earth rotation and its interaction with other geophysical phenomena

Convener: **Prof. Dr. Barbara Kolaczek**, Space Research Centre, Polish Academy of Sciences, Bartycka 18 A, 00716 Warsaw, Poland; Tel: +48-22-403766, Fax: +48-39-121273, E-mail: KOLACZEK@CBK.WAW.PL

Co-Conveners: **Dr. Veronique Dehant**, Royal Observatory of Belgium, 3, avenue Circulaire, 1180 Brussels, Belgium; Tel: +32-2-3730266, Fax: +32-2-3749822, E-mail: VERONIQUE.DEHANT@OMA.BE

**Dr. Jacques Hinderer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416477, Fax: +33-88616747, E-mail: JACQUES@PALLAS.U-STRASBG.FR; *after 18 October 1996* Tel: +33-3-88416477, Fax: +33-388616747  
**Dr. Harald Schuh**, Abt. 1 - Theoretische Geodäsie, Deutsches Geodätisches Forschungsinstitut, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-214, Fax: +49-89-23031-240, E-mail: schuh@dgfi.badw-muenchen.de

The Earth Rotation (variations of the length of day or rotation speed as well as polar motion and nutation) is very much influenced by variable geophysical processes such as variations of Atmospheric Angular Momentum, Ocean Angular Momentum, El Nino Phenomena, tides etc. The important effect of the atmosphere on Earth rotation variations has been well recognized but not fully understood. The new perspectives of investigations of interactions between variations of Earth rotation and sea level changes have been opened by satellite altimetric measurements of sea level variations. This symposium will be devoted to investigations of geophysical fluid interactions with the Earth rotation. It is a crucial point of the studies of the Earth rotation modelling and data acquisition at the accuracy level of 0.1 mas.

#### SE13/G9 Modelling of global change phenomena with observational geodetic and geophysical constraints

Convener: **Dr. Hans-Peter Plag**, Institut für Geophysik, Universität Kiel, Olshausenstr. 40-60, 24118 Kiel, Germany; Tel: +49-431-880-1425, Fax: +49-431-880-4432, E-mail: PGE96@RZ.UNI-KIEL.D400.DE

Co-Convener: **Dr. Benjamin Fong Chao**, Laboratory for Terrestrial Physics, NASA - Goddard Space Flight Center, Greenbelt, MD 20771, USA; Tel: +1-301-286-6120, Fax: +1-301-286-1616, E-mail: chao@denali.gsfc.nasa.gov

The current global experiments of the anthroposphere to explore the response of the Earth system to large perturbations unfortunately have the disadvantage of threatening the life support system of the investigators. Modelling the results of such experiments - or global changes - might be the only way out this quandary. Moreover, model projections of future global change phenomena are crucial in the discussion of sustainability. However, the validation of such models depends on the availability of sufficient observational constraints. The symposium is intended to bring together practitioners in geophysical and geodetic observations & analysis for assimilation, constraining and validation of Earth system models in atmosphere, hydrosphere, and solid Earth, on all time scales typical of global change phenomena.

#### SE14

#### Near-surface geophysics: archaeological prospection and archaeomagnetic dating

Conveners: **Dr. Jörg Faßbinder**, Ref. Archäologische Prospektion und Luftbildarchäologie, Bayerisches Landesamt für Denkmalpflege, Hofgraben 4, 80539 München, Germany; Tel: +49-89-2114-228, Fax: +49-89-2114-300

**Dr. Viktor Hoffmann**, Institut für Allgemeine und Angewandte Geophysik, Universität München, Theresienstr. 41, 80333 München, Germany; Tel: +49-89-2394-4232, Fax: +49-89-2394-4205, E-mail:VIKTORHO@ROCKMAG.GEOPHYSIK.UNI-MUENCHEN.DE

#### 01 Archaeological prospection

Convener: **Dr. Armin Schmidt**, Dept. of Archaeological Sciences, University of Bradford, Bradford BD7 1DP, United Kingdom; Tel: +44-1274-383542, Fax: +44-1274-385190, E-mail: a.schmidt@bradford.ac.uk

Co-Convener: **Dr. Jörg Faßbinder**, Ref. Archäologische Prospektion und Luftbildarchäologie, Bayerisches Landesamt für Denkmalpflege, Hofgraben 4, 80539 München, Germany; Tel: +49-89-2114-228, Fax: +49-89-2114-300

Scope of session:

1. Recent developments in laboratory based measurements of relevant physical parameters (e.g. resistivity/conductivity, magnetic properties, water content, dielectric permittivity, sound velocity and attenuation)
2. Development of new instruments for on-site measurements
3. New methods in archaeological prospection, how realistic is 3D? (resistivity tomography, ground penetrating radar)
4. Modelling and prediction of anomalies, the direct and inverse problem
5. Signal analysis, noise reduction and filtering
6. Integrated studies of local or regional scope, integration of aerial photography
7. Case studies

#### 02 Archaeomagnetic dating

Convener: **Prof. Dr. Niels Abrahamsen**, Dept. of Earth Sciences, Geophysical Lab., University of Aarhus, Finlandsgade 8, 8200 Aarhus, Denmark; Tel: +45-8942-4355, Fax: +45-8610-1003, E-mail: geofabe@aau.dk

Co-Convener: **Dr. Lauri Pesonen**, Dept. of Geophysics, Lab. for Paleomagnetism, Geological Survey of Finland, Betonimiehenkuja 4, 02150 Espoo, Finland; Tel: +358-0-469-31, Fax: +385-0-462-205, E-mail: 16LAURI@OTAVAX.GSF.FI

In this symposium we want to combine relevant information and techniques in relation to Archaeomagnetism, Archaeointensity and Secular Variation of artefacts and sediments in relation to dating. We therefore call for papers about geomagnetic records in archaeological objects and in sediments, as well as questions related to magnetic secular

variation, archaeo- and palaeointensity, magnetic properties, and other related topics such as relative sediment-intensity-indicators, recent advances in dating of young sediments, etc.

### 03 Near surface geophysics: engineering geophysics

Convener: **Prof. S.P. Papamarinopoulos**, 40 Byron Street, 16451 Argypopolis, Athens, Greece; Tel: +30-1-9957346, Fax: +30-1-995-7346, E-mail: STAVROX@CORFU.ATHENS.ACROPOLIS.GR

Co-Convener: **Dr. Michel Dietrich**, IRIGM/LGIT, Université Joseph Fourier Grenoble 1, B.P. 53 X, 38041 Grenoble, France; Tel: +33-7651-4419, Fax: +33-7651-4422, E-mail: MDIETRIC@LGIT.OBSERV-GR.FR; *after 18 October 1996* Tel: +33-4-7651-4419, Fax: +33-4-7651-4422

The scope of the session is to show the advances of geophysics in the theoretical and experimental knowledge of the shallow subsurface for engineering and environmental problems.

Oral session and poster presentation topics include:

- near-surface imaging and site characterization using seismic and/or potential field methods;
- monitoring of the time variations of the subsurface properties;
- tomography and well logging techniques;
- data acquisition in urban environments;
- applications to ground water problems and evaluation of hazardous waste sites

### SE15 Rock- and palaeomagnetism and environmental magnetism

Convener: **Dr. Viktor Hoffmann**, Institut für Allgemeine und Angewandte Geophysik, Universität München, Theresienstr. 41, 80333 München, Germany; Tel: +49-89-2394-4232, Fax: +49-89-2394-4205, E-mail: VIKTORHO@ROCKMAG.GEOPHYSIK.UNI-MUENCHEN.DE

#### 01 Magnetic signature of diagenesis and weathering

Convener: **Dr. Adry J. van Velzen**, Department of Earth Sciences, University of Oxford, Parks Road, Oxford OX1 3PR, United Kingdom; Tel: +44-1865-272051, Fax: +44-186-5-272072, E-mail: ADRY.VANVELZEN@EARTH.OX.AC.UK

Co-Convener: **Dr. Ann M. Hirt**, Institut f. Geophysik, ETH Hoenggerberg, 8093 Zürich, Switzerland; Tel: +41-1-633-2705, Fax: +41-1-633-1065, E-mail: ann@mag.geo.phys.ethz.ch

The palaeomagnetic record may be influenced significantly by diagenesis and weathering. Subtle changes in rock magnetic properties are important when these parameters are used for normalization purposes, e.g., in relative

palaeointensity studies or as palaeoclimatic proxies. More severe changes in the palaeomagnetic record due to dissolution of ferromagnetic mineralogy or remagnetisation also influence directional studies and absolute palaeointensity determinations. Contributions are solicited that study diagenetic- and weathering-induced changes in magnetic mineralogy and laboratory simulations of these processes. The session will provide a forum for discussion of recent progress in magnetic and non-magnetic methods and techniques to recognize such changes in the palaeomagnetic record.

#### 02 Environmental magnetism with emphasis on calibration of magnetic methodology

Convener: **Prof. Dr. Friedrich Heller**, Institut f. Geophysik, ETH Hoenggerberg, 8093 Zürich, Switzerland; Tel: +41-1-633-2625, Fax: +41-1-633-1065, E-mail: HELLER@GEO.PHYS.ETHZ.CH or FRIEDER@MAG.GEO.PHYS.ETHZ.CH

Co-Conveners: **Dr. Frank Oldfield**, PAGES Office, Baerenplatz 2, 3011 Bern, Switzerland; Tel: +41-31-312-3133, Fax: +41-31-312-3168, E-mail: oldfield@pageigbp.unibe.ch

**Dr. Ian Snowball**, Laboratory for Palaeomagnetism, Geological Survey of Finland, Betonimiehenkuja 4, 02150 Espoo, Finland; Tel: +358-0-4693-2566, Fax: +358-0-462-205, E-mail: IAN.SNOWBALL@GSF.FI

Studies are welcome which are concerned with the formation of rock magnetic signatures resulting from all aspects of environmental change including pollution, palaeoclimatic or sediment source variation and soil magnetism. Examples of interdisciplinary calibration and/or modelling of the magnetic proxy records based on geochemical, pedological, botanical or fauna changes etc. will be especially appreciated.

#### 03 Palaeomagnetism and tectonic evolution of central Europe and the Alpine region (co-sponsored by EUG)

Convener: **Prof. Dr. Hermann J. Mauritsch**, Institut für Geophysik, Montanuniversität Leoben, Franz-Josef-Str. 18, 8700 Leoben, Austria; Tel: +43-3842-4610321, Fax: +43-3842-4610322, E-mail: GEOPHYS2@UNILEOBEN.AC.AT

Co-Conveners: **Dr. Jean-Bernard Edel**, Lab. de Paleomagnetisme, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-8841-6374, Fax: +33-88616747, E-mail: jbedel@eopg.u-strasbg.fr; *after 18 October 1996* Tel: +33-3-8841-6374, Fax: +33-3-88616747

**Dr. Emö Marton**, Eötvös Lorand Geophysical Institute, POB 35, 1440 Budapest, Hungary; Tel: +36-1-3150-163, Fax: +36-1-63-7256, E-mail: H11000MAR@ELLA.HU



The scope of the symposium will be the analysis of palaeomagnetic results from the variscan and pre-variscan as well as the alpidic realm of Europe in order to identify individual tectonic developments. Papers are welcome dealing with fundamental problems of the analysis of palaeomagnetic data as well as the development of apparent polar wander path's, magnetostratigraphy, palaeotectonic and geodynamics.

#### 04 Magnetic properties of minerals and rocks

Convener: **Prof. Dr. David J. Dunlop**, Physics Department, Erindale College, University of Toronto, Mississauga Road North, Mississauga, Ontario L5L 1C6, Canada; Tel: +1-905-828-3968, Fax: +1-905-828-3717, E-mail: [dunlop@physics.utoronto.ca](mailto:dunlop@physics.utoronto.ca)

Co-Conveners: **Dr. Mark J. Dekkers**, Faculty of Earth Sciences, Paleomagnetic Lab. 'Fort Hoofddijk', University of Utrecht, Budapestlaan 17, 3584 CD Utrecht, The Netherlands; Tel: +31-30-253-1671, Fax: +31-30-253-5030, E-mail: [DEKKERS@HOTSPOT.GEOF.RUU.NL](mailto:DEKKERS@HOTSPOT.GEOF.RUU.NL)

**Dr. Viktor Hoffmann**, Institut für Allgemeine und Angewandte Geophysik, Universität München, Theresienstr. 41, 80333 München, Germany; Tel: +49-89-2394-4232, Fax: +49-89-2394-4205, E-mail: [viktorho@rockmag.geophysik.uni-muenchen.de](mailto:viktorho@rockmag.geophysik.uni-muenchen.de)

#### 05 Biomagnetic materials: basic properties and applications

Convener: **Dr. Tatyana Gendler**, Institute of Physics of the Earth, B. Gruzinskaya 10, 123810 Moscow, Russia; Tel: +7-095-254-9105, Fax: +7-095-254-9088, E-mail: [LYKOV@GLAS.APC.ORG](mailto:LYKOV@GLAS.APC.ORG)

Co-Conveners: **Dr. Barbara Ann Maher**, School of Environmental Sciences, University of East Anglia, Norwich NR4 7TJ, United Kingdom; Tel: +44-1603-593122, Fax: +44-1603-507719, E-mail: [b.maher@uea.ac.uk](mailto:b.maher@uea.ac.uk)

**Dr. Nikolai Petersen**, Institut f. Geophysik, Universität München, Theresienstr. 41, 80333 München, Germany; Tel: +49-89-2394-4233, Fax: +49-89-2394-4205, E-mail: [petersen@magbakt.geophysik.uni-muenchen.de](mailto:petersen@magbakt.geophysik.uni-muenchen.de)

Contributions are invited - both oral and poster - that deal with

- biogenic magnetic material in sediments and soil (amount of material, type, importance for measurements of natural and artificial magnetizations)
- biogenic magnetic material in organisms (type of material, function, growth mechanism and environment)
- technical and medical applications of biogenic magnetic material.

#### SE16/G15

##### Potential fields in geophysics and geodesy

Convener: **Prof. Dr. Wolfgang R. Jacoby**, Institut für Geowissenschaften, Johannes Gutenberg Universität, Saarstr. 21, 55122 Mainz, Germany; Tel: +49-6131-39-3223, Fax: +49-6131-39-4769, E-mail: [JACOBY@MZDMZA.ZDV.UNI-MAINZ.DE](mailto:JACOBY@MZDMZA.ZDV.UNI-MAINZ.DE)

Co-Conveners: **Dr. Carla Braitenberg**, Dept. of Earth Sciences, Università di Trieste, Via E. Weiss 1, 34100 Trieste, Italy; Tel: +39-40-676-2258, Fax: +39-40-575-519, E-mail: [BERG@UNIV.TRIESTE.IT](mailto:BERG@UNIV.TRIESTE.IT)

**Prof. Dr.-Ing. Erwin Groten**, Institut für Physikalische Geodäsie, Technische Hochschule Darmstadt - FB 12, Petersenstr. 13, 64287 Darmstadt, Germany; Tel: +49-6151-163-109, Fax: +49-6151-164-512, E-mail: [GROTEN@IPG0.IPG.VERM.TH-DARMSTADT.DE](mailto:GROTEN@IPG0.IPG.VERM.TH-DARMSTADT.DE)

#### SE17/G2 Determination of the high-resolution gravity field

Convener: **Dr. Olivier Francis**, Royal Observatory of Belgium, 3, avenue Circulaire, 1180 Brussels, Belgium; Tel: +32-2-373-0344, Fax: +32-2-374-9822, E-mail: [FRANCIS@OMA.BE](mailto:FRANCIS@OMA.BE)

Co-Conveners: **Dr. Jacques Hinderer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416477, Fax: +33-88616747, E-mail: [JACQUES@PALLAS.U-STRASBG.FR](mailto:JACQUES@PALLAS.U-STRASBG.FR); after 18 October 1996 Tel: +33-3-88416477, Fax: +33-3-88616747

The combination of land-based data and satellite data (GPS/levelling, radar altimetry, ...) allows to determine the gravity field with a high resolution. This session covers methodology, theory but also concrete realizations. Global as well as regional results are welcome.

#### SE18/G3 Determination of 3D crustal deformations and their geodynamic implications

Convener: **Prof. Dr. Hermann Drewes**, Abt. 1, Deutsches Geodätisches Forschungsinstitut, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-107, Fax: +49-89-23031-240, E-mail: [drewes@dgfi.badw-muenchen.de](mailto:drewes@dgfi.badw-muenchen.de)

Co-Conveners: **Dr. Geoffrey Blewitt**, Dept. of Geomatics, University of Newcastle upon Tyne, Claremont Road, Newcastle-upon-Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-5040, Fax: +44-191-222-8691, E-mail: [GEOFFREY.BLEWITT@NEWCASTLE.AC.UK](mailto:GEOFFREY.BLEWITT@NEWCASTLE.AC.UK)

Crustal deformations are monitored by various geodetic and geophysical methods. In the past, the determination was normally split into the horizontal and the vertical components due to the specific sensitivity of observation techniques. Modern analyses comprise a complete three-dimensional modelling. The scope of the symposium includes both geodetic and geophysical determinations of crustal deformations in three dimensions. Emphasis shall be given to geodynamic interpretations and models.



**SE19 Plume-lithosphere interaction, geophysical anomalies and volcanism**

Convener: **Cinzia G. Farnetani**, Dept. Terre-Atmosphere-Ocean, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-443222-05, Fax: +33-1-443222-00, E-mail: CINZIA@GEOPHY.ENS.FR

Co-Conveners: **Dr. Axel Björnsson**, Nordic Volcanological Institute, University of Iceland, Grensasvegur 50, 108 Reykjavik, Iceland; Tel: +354-525-4496, Fax: +354-562-9767, E-mail: AXEL@NORVOL.HI.SI

**Prof. Dr. Wolfgang R. Jacoby**, Institut für Geowissenschaften, Johannes Gutenberg Universität, Saarstr. 21, 55122 Mainz, Germany; Tel: +49-6131-39-3223, Fax: +49-6131-39-4769, E-mail: jacoby@mzdmza.zdv.uni-mainz.de

**Prof. Boris M. Naimark**, International Institute of Earthquake Prediction Theory and Mathematical Geophysics, Warshavskoye Sh. 79, k. 2, 113556 Moscow, Russia; Tel: +7-095-110-4678, Fax: +7-095-310-7032, E-mail: NAIMARK@MITP.RSSI.RU

**SE20 Satellite radar: the seafloor and geodynamics**

Convener: **Dr. Anny Cazenave**, GRGS/CNES, 14, Av. Edouard Belin, 31400 Toulouse, France; Tel: +33-61332922, Fax: +33-61253205, E-mail: CAZENAVE@MFH.CNES.FR; *after 18 October 1996* Tel: +33-5-61332922, Fax: +33-5-61253205

Co-Conveners: **Dr. Karen M. Marks**, N/OES 12, SSMC-4, Sta. 8419, NOAA, 1305 East-West Highway, Silver Spring, MD 20910, USA; Tel: +1-301-713-2860, Fax: +1-301-713-4475, E-mail: KAREN@TOPAZ.GRDL.NOAA.GOV

**Dr. Walter H.F. Smith**, N/OES 12, SSMC-4, Sta. 8423, NOAA, 1305 East-West Highway, Silver Spring, MD 20910, USA; Tel: +1-301-713-2860, Fax: +1-301-713-4475, E-mail: WALTER@AMOS.GRDL.NOAA.GOV

The purpose of this symposium is to show the impact of high-resolution mapping of the oceans by ERS-1 and Geosat satellite altimetry on various areas of marine geophysics and geodesy. Topics will include, but are not limited to, computation of high-resolution mean sea-surface, gravity anomalies and seafloor topography at regional and global scales, plate kinematics and reconstructions, mid-ocean ridge structure and segmentation, fracture zone processes, back-arc basin tectonics, microplate structures, seamount statistics, bathymetric prediction, and the mechanical and thermal structure of the oceanic lithosphere. Both modelling and observational studies are encouraged.

**SE21/G16 Local, regional and global relations of gravity with other geological and geophysical fields**

Convener: **Dr. Klaus Regenauer-Lieb**, Geology Department, University of Auckland, Private Bag, Auckland, New Zealand; Tel: +64-9-817-7-682, Fax: +64-9-373-7436, E-mail: K.REGENAUER@AUCKLAND.AC.NZ and REGENAUER@GOOFY.ZDV.UNI-MAINZ.DE

Co-Conveners: **Dr. Peter Schmidt**, Bundesanstalt für Geowissenschaften und Rohstoffe, Stilleweg 2, 30655 Hannover, Germany; Tel: +49-511-643-3663, Fax: +49-511-643-3240, E-mail: b322schmidt@bzm401.hannover.bgr.de  
**Dr. Eckbert Seidler**, Institut für Meteorologie und Geophysik, Feldbergstr. 47, 60323 Frankfurt/Main, Germany; Tel: +49-69-798-23961, Fax: +49-69-798-23280, E-mail: INGRID@GEOPHYSIK.UNI-FRANKFURT.DE

This session invites joint interpretations of geophysical, geodetical and geological data with emphasis on variations of the gravity field. Gravity and geoid signatures can provide constraints for the verification of numerical and tectonic models of geodynamic processes inside the convecting earth imaged in a different manner by e.g. seismic tomographic, geothermal, geochemical, magnetic and structural geological investigations. Contributions using the methodology of joint interpretations are welcome for any scale: global processes (mantle plumes and plate tectonic models with the position of spreading ridges, subduction zones and continents past and present) as well as regional and detailed local studies (topography, faults, heat flow, rheology, upper mantle and crustal structure) shall be used to further the merging of geodynamic disciplines.

**SE22 Elastic wave velocities in rocks: anisotropy, heterogeneity and frequency effects**

Convener: **Dr. David Mainprice**, Lab. de Tectonophysique, Université de Montpellier, Place Bataillon, 34095 Montpellier Cedex 05, France; Tel: +33-67143602, Fax: +33-67143603, E-mail: DAVID@DSTU.UNIV-MONTP.FR; *after 18 October 1996* Tel: +33-4-67143602, Fax: +33-4-67143603

Co-Conveners: **Prof. Dr. Yves Gueguen**, Laboratoire de Géologie, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-44322000, Fax: +33-1-44322211

**SE23 Relationship between various properties in sedimentary and crystalline rocks**

Convener: **Dr. Ernst Huenges**, GeoForschungs-Zentrum Potsdam, Telegrafenberg A6, 14473 Potsdam, Germany; Tel: +49-331-288-1440, Fax: +49-331-288-1450, E-mail: HUENGES@GFZ-POTSDAM.DE

Co-Conveners: **Dr. Ilmo T. Kukkonen**, Geological Survey of Finland, Betonimiehenkuja 4, 02150 Espoo, Finland; Tel: +358-0-4693-2270, Fax: +358-0-462205, E-mail: ilmo.kukkonen@gsf.fi

**Dr. Janos L. Urai**, Shell International Exploration and Production Research and Technical Services, P.O. Box 60, 2280 AB Rijswijk, The Netherlands; Tel: +31-70-311-3126, Fax: +31-70-311-3110, E-mail: j.l.uraij@siep.shell.com

Composition, texture, pore structure, and pore fill influence the physical properties of rocks in a complex manner. The technique to estimate one physical property with the aid of measurements of others (at different scales) is commonly used

in geophysical modelling. Applications are predictions of well bore stability, hydrocarbon exploration and production, as well as in geophysical studies of physical properties at the conditions of the lower crust and mantle. This session aims at discussing the state-of-the-art in methods to estimate in-situ properties using correlations between laboratory measurements, data from boreholes, and field observations. Contributions are invited on petrophysical investigations of mudrocks and shales as well as on metamorphic, plutonic, and volcanic rocks, and on methods of predicting these properties over different length scales.

#### SE24/ HS5.1 Estimation of transport parameters in unsaturated soils

Convener: **Dr. Randel Haverkamp**, LTHE, Institut de Mecanique de Grenoble, B.P. 53, 38041 Grenoble Cedex 9, France; Tel: +33-76825057, Fax: +33-76825001, E-mail: [RANDEL@IMG.FR](mailto:RANDEL@IMG.FR); after 18 October 1996 Tel: +33-4-76825057, Fax: +33-4-76825001

Co-Convener: **Wolfgang Durner**, Institut für Hydrologie, Universität Bayreuth, Universitätsstr. 30, 95440 Bayreuth, Germany; Tel: +49-921-55-2147, Fax: +49-921-55-2366, E-mail: [WOLFGANG.DURNER@UNI-BAYREUTH.DE](mailto:WOLFGANG.DURNER@UNI-BAYREUTH.DE)

- Instrumentation for solute and flow observations in soils (soil water sampling, noninvasive methods, signal detection and processing)
- Parameter estimation (parametrization for phase distribution functions, diffusivity and permeability functions, inverse modelling techniques, combination of methods).

#### SE25 Regional magnetic survey: data, models and charts

Convener: **Dr. Pavel Hejda**, Geophysical Institute, Academy of Sciences of the Czech Republic, Bocni II., cp 1401, 14131 Praha 4 - Sporilov, Czech Republic; Tel: +42-2-67103-339, Fax: +42-2-761549, E-mail: [PH@IG.CAS.CZ](mailto:PH@IG.CAS.CZ)

Co-Convener: **Dr. Massimo Chiappini**, Istituto Nazionale di Geofisica, via di Vigna Murata 605, 00143 Rome, Italy; Tel: +39-6-5186-0313, Fax: +39-6-504 1181, E-mail: [CHIAPPINI@MARTE.INGRM.IT](mailto:CHIAPPINI@MARTE.INGRM.IT) and [CHIAPPIN@GIOVE.INGRM.IT](mailto:CHIAPPIN@GIOVE.INGRM.IT)

The session is aimed at presenting an overview of the state of repeat station measurements and magnetic surveying activity particularly (but not exclusively) on the European territory. Papers concerning magnetic surveys covering the territory of Central and Eastern Europe are highly recommended and appreciated, in conformity with IAGA resolution No. 5/95.

We call for papers in all aspects of:

- unification of standards aimed at the improvement of the comparability of measurements and the reduction of significant discrepancies between the European Union (EU) and the Countries of Central Europe (CCE) and the New Independent States (NIS)

- data acquisition and data processing
- modelling and charting methods
- analysis of the secular variation
- comparison with IGRF.

#### SE26 Comparing electromagnetic studies of the crust and upper mantle: east and west of the Tornquist-Teisseyre zone

Convener: **Prof. Andreas Junge**, Institut für Meteorologie und Geophysik, Universität Frankfurt, Feldbergstr. 47, 60323 Frankfurt/Main, Germany; Tel: +49-69-7982-4899, Fax: +49-69-7982-3280, E-mail: [JUNGE@GEOPHYSIK.UNI-FRANKFURT.DE](mailto:JUNGE@GEOPHYSIK.UNI-FRANKFURT.DE)

Co-Conveners: **Dr. Vaclav Cerv**, Geophysical Institute, Academy of Sciences of the Czech Republic, Bocni II., cp 1401, 14131 Praha 4 - Sporilov, Czech Republic; Tel: +42-2-67103-354, Fax: +42-2-761549, E-mail: [VCV@IG.CAS.CZ](mailto:VCV@IG.CAS.CZ)  
**Dr. Thorkild Maack Rasmussen**, Geological Survey of Sweden, P.O. Box 670, 75128 Uppsala, Sweden; Tel: +46-18-179353, Fax: +46-18-179210, E-mail: [THORKILD@SGU.SE](mailto:THORKILD@SGU.SE)

**Prof. Leonid L. Vanyan**, Shirshov Institute of Oceanology, Russian Academy of Sciences, Krasikova 23, 117218 Moscow, Russia; Tel: +7-095-124-7956, Fax: +7-095-1245983, E-mail: [VANYAN@GEO.SIO.RSSI.RU](mailto:VANYAN@GEO.SIO.RSSI.RU)

It is planned to facilitate the exchange of new developments in EM-induction studies in view of future investigations in the region of the Tornquist-Teisseyre zone. Contributions of all fields in electromagnetic studies are welcome, i.e. local and regional electromagnetic studies (both active and passive methods, of course preferentially but not necessarily related to the Tornquist-Teisseyre Zone), comparison of methods, theoretical work (modelling and inversion), data processing schemes, laboratory work.

#### SE27 Tectonic evolution and thermal structure at mid-ocean ridges

Convener: **Dr. Donna Blackman**, Scripps Institute of Oceanography, 9500 Gilman Drive, La Jolla, CA 92093-0225, USA; Tel: +1-619-534-8813, Fax: +1-619-534-5332, E-mail: [dkb@mah.ucs.d.edu](mailto:dkb@mah.ucs.d.edu) and [dblackman@ucsd.edu](mailto:dblackman@ucsd.edu)

Co-Conveners: **Emilie Hooft**, MS #24, Woods Hole Oceanographic Institution, Clark 272 South, Woods Hole, MA 02543-1542, USA; Tel: +1-508-289-2838, Fax: +1-508-457-2150, E-mail: [EHOOFT@WHOI.EDU](mailto:EHOOFT@WHOI.EDU)

**Dr. Tim A. Minshull**, Bullard Laboratories, Madingley Road, Cambridge, CB3 0EZ, United Kingdom; Tel: +44-1223-333400, Fax: +44-1223-360779, E-mail: [minshull@esc.cam.ac.uk](mailto:minshull@esc.cam.ac.uk)

This session will focus on the thermal structure of young oceanic lithosphere and the architecture of the crust along oceanic spreading centers. The intent is to combine presentations of recently collected data from mid-ocean ridges and new results from theoretical studies that attempt to relate the observed crustal structure to the thermal, tectonic and morphologic setting. We encourage contributions from a range of sub-

disciplines within this topic including, but not limited to: seismic reflection and refraction, potential field, seafloor morphology, fault distribution/mechanics, and, relevant studies in ophiolites.

## SE28 **Lithospheric structure and seismicity at convergent margins**

Convener: **Prof. Dr. Ernst R. Flüh**, GEOMAR, Wischhofstr. 1-3, 24148 Kiel, Germany; Tel: +49-431-600-2323, Fax: +49-431-600-2928, E-mail: EFLUEH@GEOMAR.DE

Co-Conveners: **Dr. Ramon Carbonell**, Dept. de Geofísica, Institute of Earth Sciences, "Jaume Almera", CSIC, Solé i Sabaris, s/n, 08028 Barcelona, Spain; Tel: +34-3-330-2716, Fax: +34-3-4110012, E-mail: RCARBONELL@IJA.CSIC.ES  
**Dr. Diego Cordoba**, Catedra de Geofísica, Fac. de Ciencias Físicas, Universidad Complutense de Madrid, Paseo Juan XXIII, No. 1, 28040 Madrid, Spain; Tel: +34-1-394-440, Fax: +34-1-394-4398, E-mail: DCORDOBA@EUCMOS.SIM.UCM.ES

This symposium addresses research related to the structure and tectonic processes at convergent margins, where much of the world's population resides. Such margins are threatened by natural hazards such as earthquakes, tsunamis, and volcanism. They also contain valuable mineral and hydrocarbon resources. The wide occurrence of bottom simulating reflections (BSR) at these margins is a major new focus. Present global estimates of the methane in hydrated sediment exceeds that of all discovered gas fields. New seismic data (near vertical and wide angle, often onshore-offshore) provide detailed images of the lithospheric structure. High resolution crustal images of active margins that provide new insight to its tectonic evolution, and the relationship between surface and deep structures and/or processes are especially appropriate for this symposium. Also the seismicity, the cause of earthquake asperities as well as the value of seismic gaps in earthquake hazards mitigation shall be discussed, based on results from local and global networks. Contributions from bathymetric, geothermal, potential field data, drilling results and modelling results are appropriate for presentation and discussion.

## SE29/ NP1.1 **Scaling, multifractals and nonlinearity in solid Earth geophysics**

Convener: **Dr. Jean Schmittbuhl**, Dept. T.A.O., Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-4432-2213, Fax: +33-1-44322200, E-mail: SCHMITTB@GEOPHY.ENS.FR

Co-Conveners: **Dr. Per Bak**, Dept. of Physics, Brookhaven National Laboratory, P.O.Box 5000, Upton, Long Island, NY 11973, USA; E-mail: BAK@CMTH.PHY.BNL.GOV

**Dr. Hans J. Herrmann**, P.M.M.H., E.S.P.C.I., 10, rue Vauquelin, 75231 Paris Cedex 05, France; Tel: +33-1-4079-4722, Fax: +33-1-407-9-4523, E-mail: HANS@PMMH.ESPCI.FR

**Prof. Donald L. Turcotte**, Dept. of Geological Sciences, Cornell University, 2122 Snee Hall, Ithaca, NY 14853-1504, USA; Tel: +1-607-255-7282, Fax: +1-607-254-4780, E-mail: turcotte@geology.cornell.edu and grant@geology.geo.cornell.edu

Papers on all aspects of scaling, multifractals, and nonlinearity applied to solid earth geophysical problems are welcome. Subjects are expected to include seismicity, tectonics, volcanism, mantle convection, geomagnetics, evolution of landforms and drainage networks, and others that fit under the general heading.

## SE30 **Investigation and reconstruction of pre-instrumental and historical earthquakes**

Conveners: **Dr. Rudolf Gutdeutsch**, Institut f. Meteorologie und Geophysik, Universität Wien, Nordbergstr. 17, 1090 Wien, Austria; Tel: +43-1-31336-8226, Fax: +43-1-31336-775

**Prof. Dr. Gerassimos A. Papadopoulos**, Seismological Institute, National Observatory of Athens, P.O. Box 20048, Thessio, 11810 Athens, Greece; Tel: +30-1-3462-664, Fax: +30-1-342-6005

## III. Geodesy (G)

### G1 **Monitoring of long-term gravity variations and their reliability**

Convener: **Dr. Olivier Francis**, Royal Observatory of Belgium, 3, avenue Circulaire, 1180 Brussels, Belgium; Tel: +32-2-373-0344, Fax: +32-2-374-9822, E-mail: FRANCIS@OMA.BE

Co-Convener: **Dr. Jacques Hinderer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416477, Fax: +33-88616747, E-mail: jacques@pallas.u-strasbg.fr; after 18 October 1996 Tel: +33-3-88416477, Fax: +33-3-88616747

The monitoring of long-term gravity variations becomes more and more precise thanks to the progress made in absolute gravimetry. Nowadays, one can monitor the drift of the superconducting gravimeters with an accuracy of about one microgal. This session is devoted to the inter-comparison between absolute and relative gravimeters as well as to the interpretation and the modelling of long-term gravity variations (long-period tides, polar motion, water table effects).

### G2/SE17 **Determination of the high-resolution gravity field**

Convener: **Dr. Olivier Francis**, Royal Observatory of Belgium, 3, avenue Circulaire, 1180 Brussels, Belgium; Tel: +32-2-373-0344, Fax: +32-2-374-9822, E-mail: FRANCIS@OMA.BE

Co-Convener: **Dr. Jacques Hinderer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416477, Fax: +33-88616747, E-mail: JACQUES@PALLAS.U-STRASBG.FR; after 18 October 1996 Tel: +33-3-88416477, Fax: +33-3-88616747

The combination of land-based data and satellite data (GPS/levelling, radar altimetry, ...) allows to determine the gravity field with a high resolution. This session covers methodology, theory but also concrete realizations. Global as well as regional results are welcome.

#### **G3/SE18 Determination of 3D crustal deformations and their geodynamic implications**

Convener: **Prof. Dr. Hermann Drewes**, Abt. 1, Deutsches Geodätisches Forschungsinstitut, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-107, Fax: +49-89-23031-240, E-mail: drewes@dgfi.badw-muenchen.de

Co-Convener: **Dr. Geoffrey Blewitt**, Dept. of Geomatics, University of Newcastle upon Tyne, Claremont Road, Newcastle-upon-Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-5040, Fax: +44-191-222-8691, E-mail: GEOFFREY.BLEWITT@NEWCASTLE.AC.UK

Crustal deformations are monitored by various geodetic and geophysical methods. In the past, the determination was normally split into the horizontal and the vertical components due to the specific sensitivity of observation techniques. Modern analyses comprise a complete three-dimensional modelling. The scope of the symposium includes both geodetic and geophysical determinations of crustal deformations in three dimensions. Emphasis shall be given to geodynamic interpretations and models.

#### **G4 Improvements in satellite orbit determination**

Convener: **Dr. Francois Nouel**, CNES, 18, Avenue E. Belin, 31055 Toulouse Cedex, France; Tel: +33-61274067, Fax: +33-61273084, E-mail: NOUEL@CST.CNES.FR; *after 18 October 1996* Tel: +33-5-61274067, Fax: +33-5-61273084

Co-Convener: **Dr. Ron Noomen**, Faculty of Aerospace Engineering, Delft University of Technology, Kluyverweg 1, 2629 HS Delft, The Netherlands; Tel: +31-15-2785377, Fax: +31-15-2785322, E-mail: ron.noomen@lr.tudelft.nl

Contemporary satellite tracking systems such as DORIS, GPS, Laser, TDRS, PRARE, etc. allow precise orbit determination. The processes to filter these types of data can vary accordingly to take the maximum benefit of the measurements in order to get the final product which is satellite position and velocity at any time.

Improvements can come from dynamical models or adequate mathematical algorithms. When reaching a few centimeter level, reference systems are also becoming critical points in the error budget.

Contributors to this session are invited to present their processes as well as their methodologies for verifying the precision or accuracy. At this level, traditional common statistics (such as runs) cannot describe the actual orbit error and suggested procedures or models are equally welcome.

#### **G5**

#### **Remote sensing for topography and geodynamics**

Convener: **Prof. Dr. Roland Klees**, Faculty of Geodetic Engineering, Delft University of Technology, Thijsseweg 11, 2629 JA Delft, The Netherlands; Tel: +31-15-278-5100, Fax: +31-15-278-3711, E-mail: klees@geo.tudelft.nl

Co-Convener: **Dr. Jonathan L. Bamber**, Mullard Space Science Laboratory, Dept. of Space and Climate Physics, University College London, Holmbury St. Mary, Dorking, Surrey RH5 6NT, United Kingdom; Tel: +44-1483-204104, Fax: +44-1483-278312, E-mail: JLB@MSSL.S3.UCL.AC.UK

The session focusses on the use of radar altimetry, laser altimetry and SAR interferometry for mapping of ice and land surface changes. In case of radar altimetry, main emphasis lies on the application of this satellite technique for mapping geometric changes over ice surfaces. For laser altimetry and SAR interferometry main emphasis is put on modelling, error propagation studies, and methodology for high accurate determination of topography and ground displacements. This includes a discussion of the major limitations, the validation of the results, and the optimal combination of multi-sensor measurements (INSAR, laser altimetry, levelling, GPS, etc.).

#### **G6/OA6 Ocean modelling from altimetry and remote sensing**

Convener: **Dr. Per Knudsen**, Geodetic Division, National Survey and Cadastre Denmark, Rentemestervej 8, 2400 Copenhagen NV, Denmark; Tel: +45-3587-5318, Fax: +45-3587-5052, E-mail: PK@KMS.MIN.DK

Co-Convener: **Dr. Pierre Yves Le Traon**, CLS, Space Oceanography Division, CNES, 18, Avenue E. Belin, 31055 Toulouse Cedex, France; Tel: +33-61281689, Fax: +33-61281832, E-mail: LETRAON@METIS.CNES.FR; *after 18 October 1996* Tel: +33-5-61281689, Fax: +33-5-61281832

This session will cover aspects of modelling the ocean dynamics using satellite altimetry and other remote sensing data. Contributions should focus on the implementation and use of inversion and assimilation techniques and on the comparison of remote sensing data with models and/or in-situ data. Results that quantitatively describe the contribution of altimetry and remote sensing data in modelling or understanding the ocean dynamics (El Nino events, large scale and mesoscale oceanic circulation, ocean tides, etc.) are of high interest.

#### **G7**

#### **Geoapplications of satellite altimetry**

Convener: **Dr. Jaroslav Klokocnik**, Astronomical Institute, Czech. Acad. of Sciences, 251 65 Ondrejov, Czech Republic; Tel: +42-2-88-1611, Fax: +42-2-881611, E-mail: jklokocn@asu.cas.cz

Co-Conveners: **Dr. Philip Moore**, Department of Civil Engineering, Aston University, Birmingham B4 7ET, United Kingdom; Tel: +44-121-359-3611, Fax: +44-121-333-3389, E-mail: MOOREP@ASTON.AC.UK

**Dr. Carl A. Wagner**, Geosciences Laboratory, NOAA/National Ocean Survey, 1305 East-West Highway, Silver Spring, Maryland 20910, USA; Tel: +1-301-713-2857, Fax: +1-301-713-4475, E-mail: CARL@HARPO.GRDL.NOAA.GOV

To bring together those who are actively engaged in the topics listed below, who want to present and discuss state-of-the-art methods and results, namely orbit analysts, geodesists, and geophysicists (oceanographers).

- marine geoid and marine geophysics with altimetry data,
- radial and crossover errors of altimeter satellites (gravity-induced errors as well as non-gravitational orbit errors, empirical 1 cpr-corrections),
- media and sea-state corrections of altimetry measurements,
- calibrations of satellite altimeters,
- reference frames (e.g. offsets between disparate altimetry missions from crossover data),
- tides from altimetry measurements,
- sea surface topography and ocean currents from satellite altimetry, incl. El Nino.

Although the geodetic and (solid earth) geophysical topics, and orbit analyses should dominate this symposium, some overlaps with an OA symposium are probably inevitable, the time schedule will take it into account.

#### **G8 The role of geodesy in the study of global change**

Convener: **Prof. Susanna Zerbini**, Dip. di Fisica, Settore di Geofisica, Università di Bologna, Viale Berti Pichat 8, 40127 Bologna, Italy; Tel: +39-51-6305019, Fax: +39-51-6305058, E-mail: ZERBINI@ASTBO1.BO.CNR.IT

Co-Convener: **Dr. Steve M. Klosko**, Hughes STX Corp., 7701 Greenbelt Road, Suite 400, Greenbelt, MD 20770, USA; Tel: +1-301-441-4124, Fax: +1-301-441-2432, E-mail: SKLOSKO@MAGUS.STX.COM and ZCSMK@GIBBS.GSFC.NASA.GOV

Because of possible anthropogenic contributions, the study of Global Change has become a central issue within the Earth and environmental sciences. Of major interest is the identification of the Global Change signals, improved understanding of their causes and manifestations, comparison with the historical/geologic records, and validation of models allowing reliable assessment of future trends and consequences. To improve the understanding of Global Change, the feedback effects induced in the global environment through interactions among the different components of the system must be identified, assessed and monitored. The problem is highly complicated because it involves a wide range of different scientific disciplines; furthermore, the interactions are complex, the interval supported by global measurements quite short, and the Global Change signals themselves quite subtle. Nevertheless, problems and priorities are being defined and the

main themes of study and research have been identified and are being pursued. Geodesy, through the use of space techniques, is capable of playing an important role through the wealth of information which is provided in observing direct and indirect manifestations of land-ocean-atmosphere interactions. The aim of the symposium is to present an up-to-date review of the major problems of the Global Change in which geodesy can contribute. In particular, it is intended to highlight the important role assumed by this discipline in establishing the framework in which the links between the terrestrial, marine and atmospheric components of the Earth system can be better understood.

#### **G9/SE13 Modelling of global change phenomena with observational geodetic and geophysical constraints**

Convener: **Dr. Hans-Peter Plag**, Institut für Geophysik, Universität Kiel, Olshausenstr. 40-60, 24118 Kiel, Germany; Tel: +49-431-880-1425, Fax: +49-431-880-4432, E-mail: PGE96@RZ.UNI-KIEL.D400.DE

Co-Convener: **Dr. Benjamin Fong Chao**, Laboratory for Terrestrial Physics, NASA - Goddard Space Flight Center, Greenbelt, MD 20771, USA; Tel: +1-301-286-6120, Fax: +1-301-286-1616, E-mail: chao@denali.gsfc.nasa.gov

The current global experiments of the anthroposphere to explore the response of the Earth system to large perturbations unfortunately have the disadvantage of threatening the life support system of the investigators. Modelling the results of such experiments - or global changes - might be the only way out this quandary. Moreover, model projections of future global change phenomena are crucial in the discussion of sustainability. However, the validation of such models depends on the availability of sufficient observational constraints. The symposium is intended to bring together practitioners in geophysical and geodetic observations and analysis for assimilation, constraining and validation of Earth system models in atmosphere, hydrosphere, and solid Earth, on all time scales typical of global change phenomena.

#### **G10 Modelling of atmospheric parameters in geodetic observations**

Convener: **Prof. Alan Dodson**, Institute of Engineering Surveying and Space Geodesy, University of Nottingham, University Park, Nottingham, NG7 2RD, United Kingdom; Tel: +44-115-951-3882, Fax: +44-115-951-3881, E-mail: ALAN.DODSON@NOTTINGHAM.AC.UK

Co-Convener: **Dr. Gunnar Elgered**, Onsala Space Observatory, Chalmers Institute of Technology, 43900 Onsala, Sweden; Tel: +46-300-60650, E-mail: KGE@OSO.CHALMERS.SE

The neutral atmosphere, and especially the varying amount of water vapour in it, has become as significant error source as the accuracy of space geodetic techniques has improved. In particular this concerns applications using radio

waves, such as Very Long Baseline Interferometry (VLBI) and the Global Positioning System (GPS), but other applications are also relevant.

Contributions are invited dealing with the variability of the refractive index in the atmosphere, including both horizontal and vertical structures, the modelling of the elevation dependence of the propagation delay (mapping functions), the site dependence of the models, and the applications of GPS to climatology and meteorology.

These studies may be based on geodetic data, or other independent measurements.

**G11/  
OA21**

**Measuring and modelling atmosphere-ocean-land interactions**

Convener: **Dr. Pascal Gegout**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416694, Fax: +33-88416477, E-mail: PASCAL@SELENE.U-STRASBG.FR and GEGOUT@SC2000.CNES.FR; *after 18 October 1996* Tel: +33-3-88416694, Fax: +33-3-88416477

Co-Conveners: **Prof. Dr. Steven R. Dickman**, Dept. of Geology, State University of New York at Binghamton, P.O. Box 6000, Binghamton, NY 13902-6000, USA; Tel: +1-607-777-2857, Fax: +1-607-777-2288, E-mail: DICKMAN@BINGVMB.CC.BINGHAMTON.EDU

**Dr. Katia Laval**, Lab. de Meteorologie Dynamique, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-44322244, Fax: +33-1-43368392, E-mail: LAVAL@LMD.ENS.FR

This symposium is devoted to the modelling and the measuring of interactive processes between the Atmosphere, Oceans, and Solid Earth which lead to global mass redistribution and angular momentum exchange.

Atmospheric winds and pressure variations induce oceanic currents and changes in sea level, and cause crustal load deformations. This session will explore the models relating such atmospheric forcing to the oceanic and crustal responses, on time scales ranging from daily to geological, as determined locally, regionally, and globally. Processes that focus on the dynamic or static response of the oceans, and the gravito-elastic or visco-elastic response of the solid Earth are among those that will be investigated. This session will also explore geodetic methods of measurement of the state of the atmosphere, oceans and solid earth, and observations associated with the interactions.

This session will also focus on the estimation of oceanic angular momentum (OAM) and atmospheric angular momentum (AAM), and their implications for variations in Earth's rotation.

**G12**

**Developments in spectral stochastic techniques for gravity field modelling**

Convener: **Prof. Dr. Ilias N. Tziavos**, Dept. of Geodesy and Surveying, Univ. Box 440, University of Thessaloniki, P.O. Box 449, 54006 Thessaloniki, Greece; Tel: +30-31-996-125, Fax: +30-31-996-408, E-mail: tziavos@eng.auth.gr and tziavos@olymp.ccf.auth.gr

Co-Convener: **Prof. Dr. Martin Vermeer**, Finnish Geodetic Institute, Geodeetinrinne 2, 02431 Masala, Finland; Tel: +358-9-295-55215, Fax: +358-9-295-55200, E-mail: MV@FGI.FI

The session will concentrate on recent progress in spectral methods used for gravity field modelling. Attention will be given to methods like (a) Fast collocation, (b) Fast Fourier Transform (FFT) and Fast Hartley Transform (FHT), (c) Use of wavelets in geodesy, (d) Input-Output System Theory (IOST), (e) Least Squares Adjustment in the Frequency Domain (LSAFD), (f) Point mass modelling and inversion by spectral techniques, (g) Spectral combination of heterogeneous data. Developments and analysis of any other relevant techniques and methodologies will also be welcome. Emphasis will be placed on the use of the above mentioned methods for determining the gravity field in local, regional and global scale by the optimal combination of heterogeneous data sets. Comparative results between methods, as well as new theories, methodologies and techniques on terrain modelling, geoid modelling, altimetry and airborne gravity data processing, data resolution specifications and software developments are strongly invited.

**G13/  
SE12**

**Earth rotation and its interaction with other geophysical phenomena**

Convener: **Prof. Dr. Barbara Kolaczek**, Space Research Centre, Polish Academy of Sciences, Bartycka 18 A, 00716 Warsaw, Poland; Tel: +48-22-403766, Fax: +48-39-121273, E-mail: KOLACZEK@CBK.WAW.PL

Co-Conveners: **Dr. Veronique Dehant**, Royal Observatory of Belgium, 3, avenue Circulaire, 1180 Brussels, Belgium; Tel: +32-2-3730266, Fax: +32-2-3749822, E-mail: VERONIQUE.DEHANT@OMA.BE

**Dr. Jacques Hinderer**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416477, Fax: +33-88616747, E-mail: JACQUES@PALLAS.U-STRASBG.FR; *after 18 October 1996* Tel: +33-3-88416477, Fax: +33-3-88616747

**Dr. Harald Schuh**, Abt. 1 - Theoretische Geodäsie, Deutsches Geodätisches Forschungsinstitut, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-214, Fax: +49-89-23031-240, E-mail: schuh@dgfi.badw-muenchen.de

The Earth Rotation (variations of the length of day or rotation speed as well as polar motion and nutation) is very much influenced by variable geophysical processes such as variations of Atmospheric Angular Momentum, Ocean Angular Momentum, El Nino Phenomena, tides etc. The important effect of the atmosphere on Earth



rotation variations has been well recognized but not fully understood. The new perspectives of investigations of interactions between variations of Earth rotation and sea level changes have been opened by satellite altimetric measurements of sea level variations. This symposium will be devoted to investigations of geophysical fluid interactions with the Earth rotation. It is a crucial point of the studies of the Earth rotation modelling and date acquisition at the accuracy level of 0.1 mas.

**G14 Geodetic and geodynamic programmes of the CEI (Central European Initiative)**

Convener: **Prof. Dr.-Ing. Janusz Sledzinski**, Institute of Geodesy and Geodetic Astronomy, Warsaw University of Technology, Plac Politechniki 1 p. 43, 00661 Warsaw, Poland; Tel: +48-22-622-8515, Fax: +48-22-621-0052, E-mail: SLEDZINSKI@GIK.PW.EDU.PL

The symposium will give a good opportunity to review all geodetic and geodynamic projects realized in the frame of international cooperation of all 15 countries assembled within the Central European Initiative (CEI). Papers covering the following subjects are particularly welcome: programmes CERGOP (Central Europe Regional Geodynamics Project) and UNIGRACE (Unification of the Gravity Systems in Central and Eastern Europe), results of work of scientific Study Groups CSG of the CEI Section C "Geodesy", projects of new EUREF campaigns in CEI countries, new role of permanent GPS stations in Central Europe and results of cooperation among universities of CEI countries.

**G15/ SE16 Potential fields in geophysics and geodesy**

Convener: **Prof. Dr. Wolfgang R. Jacoby**, Institut für Geowissenschaften, Johannes Gutenberg Universität, Saarstr. 21, 55122 Mainz, Germany; Tel: +49-6131-39-3223, Fax: +49-6131-39-4769, E-mail: JACOBY@MZDMZA.ZDV.UNI-MAINZ.DE

Co-Conveners: **Dr. Carla Braitenberg**, Dept. of Earth Sciences, Università di Trieste, Via E. Weiss 1, 34100 Trieste, Italy; Tel: +39-40-676-2258, Fax: +39-40-575-519, E-mail: BERG@UNIV.TRIESTE.IT

**Prof. Dr.-Ing. Erwin Groten**, Institut für Physikalische Geodäsie, Technische Hochschule Darmstadt - FB 12, Petersenstr. 13, 64287 Darmstadt, Germany; Tel: +49-6151-163-109, Fax: +49-6151-164-512, E-mail: GROTEN@IPG0.IPG.VERM.TH-DARMSTADT.DE

**G16/ SE21 Local, regional and global relations of gravity with other geological and geophysical fields**

Convener: **Dr. Klaus Regenauer-Lieb**, Geology Department, University of Auckland, Private Bag, Auckland, New Zealand; Tel: +64-9-817-7-682, Fax: +64-9-373-7436, E-mail: K.REGENAUER@AUCKLAND.AC.NZ and REGENAUER@GOOFY.ZDV.UNI-MAINZ.DE

Co-Conveners: **Dr. Peter Schmidt**, Bundesanstalt für Geowissenschaften und Rohstoffe, Stilleweg 2, 30655 Hannover, Germany; Tel: +49-511-643-3663, Fax: +49-511-643-3240, E-mail: b322schmidt@bzm401.hannover.bgr.de  
**Dr. Eckbert Seidler**, Institut für Meteorologie und Geophysik, Feldbergstr. 47, 60323 Frankfurt/Main, Germany; Tel: +49-69-798-23961, Fax: +49-69-798-23280, E-mail: INGRID@GEOPHYSIK.UNI-FRANKFURT.DE

This session invites joint interpretations of geophysical, geodetical and geological data with emphasis on variations of the gravity field. Gravity and geoid signatures can provide constraints for the verification of numerical and tectonic models of geodynamic processes inside the convecting earth imaged in a different manner by e.g. seismic tomographic, geothermal, geochemical, magnetic and structural geological investigations. Contributions using the methodology of joint interpretations are welcome for any scale: global processes (mantle plumes and plate tectonic models with the position of spreading ridges, subduction zones and continents past and present) as well as regional and detailed local studies (topography, faults, heat flow, rheology, upper mantle and crustal structure) shall be used to further the merging of geodynamic disciplines.

**G17 PRARE system: performance and results**

Convener: **Prof. Dr. Christoph Reigber**, Dept. Kinematics and Dynamics, GeoForschungs-Zentrum Potsdam, Telegrafenberg A 17, 14473 Potsdam, Germany; Tel: +49-331-288-1100, Fax: +49-331-288-1111, E-mail: REIGBER@GFZ-POTSDAM.DE

Co-Convener: **Prof. Dr. Kaare Aksnes**, Institute of Theoretical Astrophysics, University of Oslo, Box 1029-Blindern, 0315 Oslo, Norway; Tel: +47-22-856-515, Fax: +47-22-856-505, E-mail: KAARE.AKSNES@ASTRO.UIO.NO

**IV. Hydrological Sciences (HS)**

**HS1 HS Section Lecture**

Speaker: D. Gutknecht (Wien)

Title: Hydrological sciences between methods and problems

**HS2 Open session on hydrology**

Convener: **Prof. Dr. J. Philip O'Kane**, Department of Civil & Environmental Engineering, University College Cork, College Road, Cork, Ireland; Tel: +353-21-276871 ext. 2129, Fax: +353-21-276648, E-mail: JPOKANE@IRUCCVAX.UCC.IE

**HS3 Resolving salt accumulation and its control in irrigated soils**

Convener: **Dr. John Gowing**, Centre for Land Use and Water Resources Research, University of Newcastle upon Tyne, Porter Building, Newcastle upon Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-6811, Fax: +44-191-222-6563, E-mail: CLUWRR@NEWCASTLE.AC.UK



Recent estimates suggest that the global extent of human-induced land degradation is around 76Mha. This includes 45 Mha in irrigated areas, which represents about 20% of the total extent of irrigated land. The economic consequences of loss in production and reduction in land values are severe. Conventional land reclamation practices are slow and costly and have been shown to carry risk of consequential environmental damage. There is an increasing concern for and interest in salinity management on a river basin scale, triggered by river salinity problems and increasing water scarcity.

Predictive modelling is seen as an essential tool in assessing alternative remedial strategies, refining local level irrigation management strategies or devising integrated catchment management strategies. It is arguable our understanding of the processes controlling the behaviour of the system and our ability to represent these processes in increasingly sophisticated models are constrained by lack of the required field data. The aim of the session is to explore the current state-of-the-art in salinity management including recent advances in measurement and modelling across a range of scales.

#### HS4 **Coupling fluid flow and rock stress models for fractured rock systems**

Convener: **Dr. Rebecca Lunn**, Centre for Land Use and Water Resources Research, University of Newcastle-upon-Tyne, Porter Building, Newcastle-upon-Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-6885, Fax: +44-191-222-6563

Recent research associated with deep radioactive waste repository design studies and hot dry rock geothermal energy exploitation has highlighted the importance of stress effects in the determination of hydraulic properties. Deep rocks are generally characterized by discontinuities several orders of magnitude more permeable than the rock mass itself and these form the major pathways for fluid flow. In order to accurately model flow in such fractured environments, two effects on fracture permeabilities must be accounted for: First, the permeability of discontinuities can be substantially affected by the angle of the fracture or fault plane to the current maximum principle stress field; second, the huge pressure required to achieve substantial drawdown in borehole tests, creates a local stress field which must be included in the determination of permeability values.

The aim of this session is to explore the current state-of-the-art in the coupling of rock stress and fluid flow models for fractured rock systems. Papers are encouraged that advance research in both interpretation of deep borehole permeability testing and/or conceptual and numerical modelling of local and regional flow and transport problems in deep rock masses.

#### HS5

#### **Flow and transport in unsaturated soils**

##### **01/ Estimation of transport parameters in SE24 unsaturated soils**

Convener: **Dr. Randel Haverkamp**, LTHE, Institut de Mecanique de Grenoble, B.P. 53, 38041 Grenoble Cedex 9, France; Tel: +33-76825057, Fax: +33-76825001, E-mail: [RANDEL@IMG.FR](mailto:RANDEL@IMG.FR); after 18 October 1996 Tel: +33-4-7682-5057, Fax: +33-4-76825001

Co-Convener: **Wolfgang Durner**, Institut für Hydrologie, Universität Bayreuth, Universitätsstr. 30, 95440 Bayreuth, Germany; Tel: +49-921-55-2147, Fax: +49-921-55-2366, E-mail: [wolfgang.durner@uni-bayreuth.de](mailto:wolfgang.durner@uni-bayreuth.de)

- Instrumentation for solute and flow observations in soils (soil water sampling, noninvasive methods, signal detection and processing)
- Parameter estimation (parametrization for phase distribution functions, diffusivity and permeability functions, inverse modelling techniques, combination of methods).

##### **02 Modelling the effect of heterogeneity of soil properties on flow and transport**

Convener: **Sjoerd van der Zee**, Dept. of Soil Science and Plant Nutrition; Soil Pollution and Soil Protection, Wageningen Agricultural University, P.O. Box 8005, 6700 EC Wageningen, The Netherlands; Tel: +31-317-482-103, Fax: +31-317-483-766, E-mail: [sjoerd.vanderzee@bodhyg.benp.wau.nl](mailto:sjoerd.vanderzee@bodhyg.benp.wau.nl)

Physical, chemical, and biological soil properties, as well as initial and boundary conditions for flow and transport have been shown to be spatially variable. Understanding, describing and predicting the effects on flow and transport are necessary for a wide range of problem areas: emission to atmosphere and leaching to ground water of contaminants; remediation of contaminated soil; water and nutrient availability for vegetation and crops; interpretation of field scale experiments and monitoring networks, etc. This session deals with approaches for upscaling flow and transport phenomena in heterogeneous soils. Both single and multiphase flow as well as nonreactive/reactive chemical transport studies are considered. Contributions may deal with modelling philosophy, deterministic and stochastic approaches, as well as field scale experimental research that illustrates the effects of heterogeneity.

##### **03 Soil-plant-atmosphere interactions**

Convener: **Anders Lindroth**, Dept. of Ecology and Environmental Research, Swedish University of Agricultural Sciences, P.O. Box 7072, 75007 Uppsala, Sweden; Tel: +46-18-672558, Fax: +46-18-673440, E-mail: [ANDERS.LINDROTH@SPEK.SLU.SE](mailto:ANDERS.LINDROTH@SPEK.SLU.SE)

#### **04 Multiphase flow and transport behaviour in soil/aquifer systems**

Convener: **Dr. Rae Mackay**, Centre for Land Use and Water Resources Research, University of Newcastle upon Tyne, Porter Building, Newcastle upon Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-6428, Fax: +44-191-222-6563, E-mail: cluwrr@ncl.ac.uk  
Co-Convener: **Dr. P. Grathwohl**, Geologisches Institut, Universität Tübingen, Sigwartstr. 10, 72076 Tübingen, Germany; Tel: +49-7071-29-5429, Fax: +49-7071-878-15, E-mail: grathwohl@uni-tuebingen.de

Many contaminants (such as petroleum products) are nearly insoluble in water and if released in sufficient quantities may migrate in soil and aquifer system as a distinct fluid or gaseous phase, interacting both with the rock and water systems. Experience from polluted sites shows that the water resources of a region can be acutely polluted for extended time periods by such chemicals. Consequently, understanding their chemical, biological and physical behaviour is essential both for predicting the environmental consequences following a spillage and for the development of remediation strategies where clean up is needed. Particular concerns for Non-Aqueous Phase Liquid (NAPL) research relate to the issue of dissolution kinetics from residual phase concentrations and from phase "pools". Concentrations of pollutants in groundwater or seepage water depends on the dissolution kinetics which in turn depends very much on the distribution of the NAPL in a heterogeneous porous medium: e.g. high surface to volume ratio if the NAPL is distributed as small droplets ("blobs") and small surface to volume ratio if NAPL is present as pool (causes extended time periods for complete dissolution).

The aim of this session is to explore the current state-of-the-art in multi-phase flow and transport analysis including recent advances in experimental research at field and laboratory scales as well as the development and testing of predictive models.

#### **05 Colloids and colloid-assisted contaminant transport in soils**

Convener: **Dr. Kai-Uwe Totsche**, Dept. of Soil Science, Universität Bayreuth, , 95448 Bayreuth, Germany; Tel: +49-921-55-2187, Fax: +49-921-55-2246, E-mail: TOTSCH@UNI-BAYREUTH.DE

This symposium will focus on experimental and theoretical studies of formation, transport, deposition and remobilisation of organic (DOM, Humic Substances, bacteria, viruses, surfactants, etc.) and inorganic (Fe-, Al-, Mn-(hydr)Oxides, clay minerals, rock fragments, etc.) colloids. Special consideration will be put on colloid-contaminant interactions, and the role these interactions have on

contaminant mobility within saturated and unsaturated porous media. Presentations that report experimental and theoretical work concerning surfactant interactions with solid and liquid phase components above and below the CMC are strongly encouraged.

#### **06 Frozen soils: processes and properties**

Convener: **Prof. Dr. Per-Erik Jansson**, Dept. of Soil Sciences, Swedish University of Agricultural Sciences, Box 7014, 75007 Uppsala, Sweden; Tel: +46-18-6711749, Fax: +46-18-672795, E-mail: per-erik.jansson@mv.slu.se

#### **07 Biological processes in the unsaturated soil**

Convener: **Dr. Albert Tietema**, Physical Geography and Soil Science, University of Amsterdam, Nieuwe Prinsengracht 130, 1018 VZ Amsterdam, The Netherlands; Tel: +31-20-5257-458, Fax: +31-20-5257-431, E-mail: ATIETEMA@FGB.FRW.UVA.NL

This session focusses on the interface between soil physics, soil chemistry and soil biology. Aspects of all three disciplines are strongly interrelated in determining transport processes in soils. Biological processes and organic matter dynamics have a profound effect on physical and chemical soil properties, like structure, aggregate stability and hydraulic conductivity. Also, the physical and chemical environment regulate biological processes. For instance, biological denitrification is likely to occur if nitrate, organic carbon and anaerobic conditions are present at the same time and place. A specific example of the interaction between the three disciplines are redox regimes in the unsaturated zone and their consequences for the biological processes. Presentations on the three mentioned subjects in relation to the general topic of HS5 are welcomed.

#### **HS6**

#### **Stomatal and canopy resistances in mathematical modelling of SVAT systems**

Convener: **Mr. Frantisek Matejka**, Geophysical Institute of SAS, Dubravska cesta 9, 842 28 Bratislava, Slovak Republic; Tel: +42-7-378-26-63, Fax: +42-7-375-278, E-mail: GEOFMATE@SAVBA.SK

Co-Conveners: **Anders Lindroth**, Dept. of Ecology and Environmental Research, Swedish University of Agricultural Sciences, P.O. Box 7072, 75007 Uppsala, Sweden; Tel: +46-18-672-558, Fax: +46-18-673440, E-mail: ANDERS.LINDROTH@SPEK.SLU.SE

**Dr. Viliam Novak**, Institute of Hydrology, Racienska 75, P.O. Box 94, 83008 Bratislava, Slovakia; Tel: +42-7-259-000, Fax: +42-7-259-404, E-mail: NOVAKV@UH.SAVBA.SK

Plant canopies interact with the atmosphere through exchange of mass and energy. A realistic representation of transfer processes at the vegetation-atmosphere interface requires to take into account the canopy conductance as a physiologi-

cally controlled component of the surface conductance. Thus the canopy conductances for water vapour, C- and N-gases are key features in improvement and development of soil-vegetation-atmosphere transfer (SVAT) models. Although the concept based on the surface conductance remains too complex at present for operational use with limited data, this approach offers an opportunity for the progress in mathematical modelling of interrelations in soil-vegetation-atmosphere continuum. This symposium will look at the results of theoretical and experimental studies addressing the measurement, estimation and parametrisation of stomatal conductances for leaf, plant and canopy. Results of the research dealing with relationships between leaf and canopy conductances, especially for sparse and heterogeneous canopies are welcome, as well as the contributions to better understanding of dependences of stomatal and canopy conductances on environmental factors and internal processes affecting the behaviour of stomata.

HS7/  
OA22

**Hydrological, oceanic and atmospheric processes governing heat and mass balances at northern latitudes: experiences from NOPEX and BALTEX (Co-sponsored by BAHC)**

Convener: **Prof. Sven Halldin**, NOPEX Central Office, Institut of Earth Sciences/Hydrology, University of Uppsala, Norbyvägen 18 B, 752 36 Uppsala, Sweden; Tel: +46-18-182262, Fax: +46-18-551124, E-mail: sven.halldin@hyd.uu.se  
Co-Convener: **Dr. Mikko Alestalo**, Meteorological Research, Finnish Meteorological Institute, P.O. Box 503, 00101 Helsinki, Finland; Tel: +358-0-192-9400, Fax: +358-0-179-581, E-mail: MIKKO.ALESTALO@FMI.FI

One of the largest uncertainties in present-day GCMs for predicting the future climate relates to the parameterisation of water, heat, and carbon budgets at local to continental scales at the interfaces between land, air and sea. Coordination of major experimental efforts required to solve these problems are central themes for WCRP/GEWEX and IGBP/BAHC. NOPEX (a Northern hemisphere climate Processes land-surface EXperiment) has established a new format for the meso-scale land-surface experiments by integrating hydrology and meteorology as well as intensive, long-term, and local field studies with a really-covering time-limited field studies. The BALTEX project is unique by its combination of both hydrology, oceanography, and meteorology in a single experiment delimited by the entire catchment area of the Baltic Sea. The NOPEX region is centred in the middle of the BALTEX (The Baltic Sea EXperiment) region. The main objective of both NOPEX and BALTEX are to describe and explain the budgets of water and heat over their respective regions.

The intention of this session is to utilize the synergistic potential in multi-disciplinary projects like NOPEX and BALTEX to jointly discuss the results of the projects. It specifically aims at providing results from the Concentrated Field

Efforts in 1994 and 1995, and from the Continuous Climate Monitoring programme of NOPEX, and from the initial phases of the different working groups in BALTEX (e.g. the PIDCAP experiment). Contributions from similar experiments (GCIP, BOREAS, HAPEX-Sahel, etc.) are also welcome.

The specific goals of the BALTEX are: BALTEX will explore, model and quantify the various processes determining the space and time variability of the energy and water cycle of the Baltic Sea and its catchment area. BALTEX will undertake specific assessments of the total flux divergence of heat, water and momentum for this region and determine its coupling to the large-scale atmospheric circulation and to the water exchange through the Danish Straits. The scientific objectives will be addressed by a combined observational and modelling approach where the Baltic Sea, the land surfaces of its catchment area and the atmosphere will be considered as one system.

HS8.1

**Land use change and climate feedback with particular reference to the water balance of semi-arid regions**

Convener: **Prof. Dr. Hubert H.G. Savenije**, IHE Delft, P.O. Box 3015, 2601 DA Delft, The Netherlands; Tel: +31-15-2151829, Fax: +31-15-2122921, E-mail: HSA@IHE.NL  
Co-Convener: **Dr. Axel Bronstert**, Potsdam Institute for Climate Impact Research (PIK), Postfach 601203, 14412 Potsdam, Germany; Tel: +49-331-2781-143, Fax: +49-331-2781-204, E-mail: BRONSTERT@PIK-POTSDAM.DE  
**Dr. Uwe Ulbrich**, Institut für Geophysik und Meteorologie, Kerpener Str. 13, 50923 Köln, Germany; Tel: +49-221-470-3688, Fax: +49-221-470-5161, E-mail: ULBRICH@METEO.UNI-KOELN.DE

On continental areas, the evaporation from the land surface can be a considerable component of the atmospheric water balance. In addition, land use change can have a considerable impact on the amount of water which is fed back to the atmosphere through evaporation. The degree to which rainfall is affected by land-use change through evaporation depends on three aspects: 1) the relative importance (in the atmospheric water balance) of evaporation to advected moisture; 2) the relation (in the rainfall bringing mechanism) between the amount of rainfall and the amount of precipitable moisture; and 3) the ratio of wet season evaporation to total evaporation (in the distribution of the evaporation over the year). Knowledge about the impacts of land-use changes on rainfall and on the water balance is essential for policy making in semi-arid regions. Papers which deal with moisture recycling, feedback of between land-use and atmospheric moisture, or one of the three aspects mentioned and welcomed.

## **HS8.2 Climate change and water resources management**

Convener: **Oskar Behr**, Institut f. Hydraulik, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801-3221, Fax: +43-1-5056212, E-mail: OBEHR@ECX.TUWIEN.AC.AT

In different countries, a wide range of different conclusions are drawn from the results of the analysis of climate variability and a possible climate change. The session is aimed at comparing the strategies applied in different countries to meet the future challenges of water resources management with an emphasis on quantitative aspects. Intercomparison of national approaches and regional approaches in large river basins are encouraged. Attention should be given to explaining the underlying assumptions, such as different climate scenarios, as well as the different strategies to dealing with uncertainty.

## **HS9/ OA16 Hydrology of mountainous regions**

Convener: **Dr. Robert Kirnbauer**, Institut f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801-3220, Fax: +43-1-5056212, E-mail: RKIRNBAU@FEST1.TUWIEN.AC.AT

Co-Conveners: **Dr. Ludwig N. Braun**, Kommission f. Glaziologie der Bayer. Akademie der Wissenschaften, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-196, Fax: +49-89-23031-100, E-mail: LUDWIG.BRAUN@LRZ.BADW-MUENCHEN.DE

**Prof. Dieter Gutknecht**, Inst. f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801/3222, Fax: +43-1-5056212

## **HS10/ OA15 The integration of meteorological model forecasts into real-time flood forecasting systems**

Convener: **Dr. Michael Bruen**, Department of Civil Engineering, Centre for Water Resources Research, University College, Earlsfort Terrace, Dublin 2, Ireland; Tel: +353-1-706-7378, Fax: +353-1-706-7399, E-mail: MBRUEN@IVEAGH.UCD.IE

Co-Conveners: **Prof. Nils Roar Saelthun**, Norwegian Institute for Water Research, P.O. Box 173, Kjelsaas, 0411 Oslo, Norway; Tel: +47-22-185100, Fax: +47-22-959201, E-mail: NILS.SAELTHUN@NIVA.NO

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**Prof. Ezio Todini**, Dept. of Earth and Geo-Environmental Sciences, Università di Bologna, Via Zamboni 67, 40127 Bologna, Italy; Tel: +39-51-354-537, Fax: +39-51-354-522, E-mail: ETEP@ETEP.DSNET.IT

Floods can be forecast on the basis of telemetered data, e.g. precipitation, a catchment and water levels and flows in its channel network. However there is an upper limit on the useful forecast lead-time, which is determined by the response time of the catchment. Depending on the purposes of the flood forecast this upper limit may greatly diminish the usefulness of the forecast. Attempts can be made to extend the overall forecast lead time by including a forecast of meteorological conditions together with predictions of their consequences using hydrological and hydraulic models in an overall flood forecasting system. Radar observation of the approaching storm may also be used as an intermediate update on or confirmation of the unfolding meteorological scenario. The great differences in both time and space scales between meteorological and hydrological models means that their integration into a single flood forecasting system is not an easy task. On the one hand progress must be made on reducing the useful resolution of the meteorological models to match the space and time scales of catchments. On the other hand, catchment models must be able to utilize the spatial and temporal characteristics of precipitation forecasts which such meteorological models are expected to provide. This session focusses on both aspects of this important topic. It examines progress made with meteorological models, especially the high resolution, limited area models. This includes adequate parameterisation of the processes important for precipitation generation. It also deals with appropriate hydrological and hydraulic models for forecasting with distributed inputs. Papers dealing with these issues and with the integration of both types of model and which offer insights into the modelling scale/performance trade-offs are welcome. Papers dealing with the verification, updating (using observations) and post-hoc assessment of forecasts and the quantification of uncertainties and with risk analysis are also invited.

## **HS11 Floods: generating mechanisms and their representation in deriving frequency distributions**

### **01 Physical generating mechanisms of flood producing runoff**

Convener: **Dr. Günter Blöschl**, Institut f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-588-01-3230, Fax: +43-1-5056212, E-mail: G.BLOESCHL@EMAIL.TUWIEN.AC.AT

Improved understanding of the physical generating mechanisms of flood producing runoff can be extremely useful both from a design perspective, where the critical task is to extrapolate onto extreme events well beyond existing data, and from an environmental management perspective, where the critical task is to predict some change in catchment behaviour. This session will focus on questions including: How do runoff mechanisms change when moving from average to extreme

events? How do runoff mechanisms change with catchment scale? What is the role of catchment processes (runoff generation, catchment soil moisture state, changing importance of subsurface, near-surface and surface flow pathways, spatial patterns of source areas, channel routing, floodplain storage) and the role of climatic inputs (synoptic storms, convective storms, spatial patterns of rainfall, atmospheric conditions during extreme events)? The existence of a possible upper limit (Probable Maximum Floods) and the interpretation of outliers in the light of process controls will be also addressed in this session. Case studies from both standard networks and research catchments are encouraged.

## **02 Derivation of flood frequency distributions using rainfall runoff models**

Convener: **Prof. Patrick Enda O'Connell**, Dept. of Civil Engineering, Univ. of Newcastle upon Tyne, Cassie Building, Newcastle upon Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-6405, Fax: +44-191-222-6669, E-mail: p.e.o'connell@ncl.ac.uk

New approaches to flood frequency estimation are evolving in which stochastic rainfall models are integrated with rainfall runoff models to derive flood distributions. Such approaches can incorporate physical understanding of storm rainfall and runoff generation mechanisms, as reviewed in session 01, to varying degrees, ranging from simple analytical approaches where the flood distribution can be derived from an analytical integration of simple rainfall and rainfall runoff models, to Monte Carlo simulation approaches in which rainfall time series (or space-time) are used to drive rainfall runoff models of varying structure and complexity. This session will review progress achieved in all relevant aspects of this approach, and will allow an assessment of the extent to which the current understanding of flood producing mechanisms (Session 01) is being (or can be) incorporated into the derived distribution framework. Papers are invited on all relevant methodological aspects, including model parameterization, validation and regionalization, as well as case studies.

## **HS12 Soil erosion and sediment transport**

### **01 Flow and sediment transport modelling in hydrology and geomorphology using numerical methods**

Convener: **Dr. Stuart N. Lane**, Dept. of Geography, University of Cambridge, Downing Place, Cambridge, CB2 3EN, United Kingdom; Tel: +44-1223-330241, Fax: +44-1223-333392, E-mail: SNL10@HERMES.CAM.AC.UK

Co-Convener: **Dr. Paul D. Bates**, Dept. of Geography, University of Bristol, University Road, Bristol, BS8 1SS, United Kingdom; Tel: +44-1179-289108, Fax: +44-1179-287-878, E-mail: paul.bates@bristol.ac.uk

The objectives of this session are to highlight current progress in the use of two- and three-dimensional flow and sediment transport modelling techniques in hydrology and geomorphology, with special reference to river and floodplain flows, and to raise methodological issues arising from such research with reference to relevant case-studies.

The following topics are of particular interest: three-dimensional modelling and the parameterisation of three-dimensional effects in two-dimensional models; modelling the channel-floodplain interface; turbulence modelling in natural river channels; grid issues and sub-grid scale parameterisation (e.g. roughness-topography relationships); sensitivity analysis and uncertainty; coupling flow models and hydrological models; modelling floodplain sedimentation and pollution processes; simulation of extreme events; modelling natural river channels, notably riffle-pools sequences, divided reaches and meandering reaches; and modelling river channel change including width adjustment and the evolution of bed material composition in response to sediment transport.

### **02 Impacts of engineering structures on erosion and sediment yield in rivers and river basins**

Convener: **Dr. James C. Bathurst**, Dept. of Civil Engineering, University of Newcastle upon Tyne, Claremont Road, Cassie Building, Newcastle-upon-Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-6333, Fax: +44-191-2226669, E-mail: j.c.bathurst@newcastle.ac.uk

Co-Convener: **Dr. Helmut Habersack**, Institut f. Wasserwirtschaft, Hydrologie & konstruktiven Wasserbau, Universität für Bodenkultur, Nussdorfer Lände 11, 1190 Wien, Austria; Fax: +43-222-3692924200, E-mail: HABER@EDV2.BOKU.AC.AT

Soil erosion, sediment transport, channel erosion and sedimentation, and basin sediment yield can be significantly altered by engineering structures in headwater catchments and along channels. In some cases the effect is intentional (e.g. erosion control by check dams and contour ditches, sediment transport control by sediment excluders and settling ponds). In others the effect is unintentional or secondary to the main purpose (e.g. reductions in sediment yield and increases in channel erosion downstream from dams and barrage systems). However, the effects are not often accurately predicted in advance of construction. Sometimes they evolve as planned, sometimes they are unexpectedly adverse. Yet quantitative predictions of the impacts are required for environmental impact assessments or to determine the cost/benefit ratios of proposed structures. Improved guidelines and techniques therefore need to be developed for engineering and planning use. These may involve mathematical and physical

modelling, analysis of past successes and failures or other methods. Papers are therefore requested which explore any aspect of structure impact, including prediction techniques, lessons from the past and current projects. Examples may apply to any part of the fluvial system, from headwater catchments to river channels and their outlets to lakes, reservoirs and seas.

### 03 Sediment and pollution management in lake and reservoir systems

Convener: **Prof. Dave Butcher**, Dept. of Environmental Management, University of Central Lancashire, Preston PR1 2HE, United Kingdom; Tel: +44-1772-893-963, Fax: +44-1772-892-903, E-mail: D.P.BUTCHER@UCLAN.AC.UK

Co-Conveners: **Dr. Robert W. Duck**, Dept. of Geography, University of Dundee, Dundee DD1 4HN, United Kingdom; Tel: +44-1382-344528, Fax: +44-1382-344434, E-mail: R.W.DUCK@DUNDEE.AC.UK

**Dr. Jill C. Labadz**, Centre for Water and Environmental Management, University of Huddersfield, Queensgate, Huddersfield HD1 3DH, United Kingdom; Tel: +44-1484- 472-687, Fax: +44-1484-472347, E-mail: J.C.LABADZ@HUD.AC.UK

There is a growing concern that perturbations in the hydrological regime of river and lake systems, as a result of global hydrological change, are having impacts on the transfer of sediment and associated pollutants. In the case of engineered hydraulic structures such changes were not envisaged in the design specifications. The implications for lake and reservoir systems, and the need for integrated programmes to monitor erosion and sediment transport in river systems have been increasingly recognized in recent years. There is a growing need for large scale international programmes and improved strategies to monitor and manage sediment transport and water quality.

This session will discuss the transfer and storage of sediment and pollutants through natural and engineered river, reservoir and lake systems. Papers are invited on these topics with particular regard to sources and sinks of sediment and pollutants and the management strategies involved:

1. Sedimentation problems in reservoir systems - capacity loss and management of hydraulic structures.
2. Distribution of sediment deposition in lakes and reservoirs and backwater zones.
3. Desilting of reservoir systems.
4. The effectiveness of structural modifications to reservoir systems constructed in order to manage sediments.
5. The impacts of sediment management on water resource performance and flood control.

6. The role of suspended sediments in the transport of nutrient contaminants.
7. The application and verification of mathematical and physical models to any of the above.

### 04 Extreme events: their role in sediment supply and transport

Convener: **Dr. Sue M. White**, Campus de Aula Dei, CSIC, Apto. 202, Instituto Pirenaico de Ecología, Avda. Montanana, 177, 50080 Zaragoza, Spain; Tel: +34-76-575-883, Fax: +34-76-575-884, E-mail: sue@adeix.mizar.csic.es

Co-Convener: **Dr. Wolfgang Sumner**, Civil and Environmental Engineering Hydraulics Laboratory, University of California Davis, , Davis, CA 95616, USA; E-mail: w.sumner@udavis.edu

Many recent publications have emphasized the role of extreme events as major sediment supplying and/or transporting mechanisms. Such events may be annual extremes, such as cyclones, infrequent large flood events, events with return periods of hundreds of years (such as Jokulhlaups events) or even one-off events such as dam-breaks. This session is intended as a focus for presentation of results relating to such events, and for discussion of the implications for sediment yield monitoring and estimation. Papers discussing the role of extreme events in transferring sediments from hillslopes to channels will be particularly welcome, as will work relating to changes in frequency of these events due to changing environmental conditions, changes to channel systems resulting from large events and channel recovery times following extreme events.

### HS13

#### Weather radar in urban hydrology

Convener: **Dr. Hervé Andrieu**, Division Eau, Laboratoire Central des Ponts et Chaussées - L.C.P.C., BP 19, Route de Pornic, 44340 Bouguenais, France; Tel: +33-4084-5877, Fax: +33-40845998, E-mail: handrieu@lcpc.inrets.fr; after 18 October 1996 Tel: +33-2-4084-5877, Fax: +33-2-40845998

Co-Convener: **Dr. Kevin Tilford**, Telford Research Institute, Department of Civil and Environmental Engineering, University of Salford, , Manchester M5 4WT, United Kingdom; Tel: +44-745-5000ex.3458, Fax: +44-161-745-5060, E-mail: k.a.tilford@civils.salford.ac.uk

Flooding of urban areas and pollution of receiving waters from urban drainage systems occurs because of the inadequate capacity of the sewer system and/or wastewater treatment works. There are a range of approaches to minimize flooding and pollution impact, most of which require detailed knowledge of rainfall over the urban area. Urban catchments can be small and are characterized by high sensitivity to rainfall distribution and flow hydrographs often exhibit a rapid response to rainfall. Weather radars can



provide high temporal and spatial resolution rainfall data in real-time and are consequently well suited to the demanding data requirements of urban hydrology. The aim of this session is to present and discuss the present and future contribution of weather radar data to urban hydrology.

The session could address the following topics:

- techniques for processing weather radar data for rainfall estimation over urban areas;
- short term rainfall forecasting over urban catchments using weather radar data;
- use of radar rainfall data for the hydrological simulation of urban drainage systems;
- studies of the spatial and temporal variability of rainfall fields at scales commensurate with urban hydrology;
- novel new weather radar systems for urban hydrology.

#### HS14 **Hydrological models for agricultural catchment management**

Convener: **Prof. Dr. Conleth Cunnane**, Department of Engineering Hydrology, University College, Galway, Ireland; Tel: +353-91-750425, Fax: +353-91-524913, E-mail:

CONLETH.CUNNANE@UCG.IE

Co-Convener: **Dr. Helena Damaskova**, Research Institute of Soil and Water Conservation (VUMOP), Zabovreska 250, 15627 Praha 5 - Zbraslav, Czech Republic; Tel: +42-2-591205, Fax: +42-2-591-200

This symposium follows on from the 1996 symposium on "The Hydrology of Small Agricultural Catchments" held in The Hague.

The focal point of this symposium should be the adaptation and combination of catchment hydrological models, nutrient/solute deposition and transport models and sediment transport/erosion models to provide answers to land management questions. Individual component processes of the above will also be considered using point, lumped or distributed modelling techniques with conventional or GIS techniques with point or distributed (i.e. remotely sensed) measurements.

#### HS15 **Minewater pollution: prediction and remediation**

Convener: **Dr. P.L. Younger**, Dept. of Civil Engineering, University of Newcastle upon Tyne, Cassie Building, Newcastle upon Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-7942, Fax: +44-191-222-6669, E-mail:

P.L.YOUNGER@NCL.AC.UK

Co-Convener: **Prof. Fernando Pendas Fernandez**, Dept. de Explotacion y Prospeccion de Minas, Universidad de Oviedo, C/Independencia 13, 33004 Oviedo, Spain; Tel: +34-8510-4301, Fax: +34-8510-4245

With the closure of many mines in Europe, and the cessation of dewatering, surface water pollution by uncontrolled minewater discharges is increasing in many areas. This session will examine emerging hydrological and hydrogeochemical techniques aimed at predicting the consequences of mine closure and dealing with pollutant discharges. Contributions are invited on the following topics:

mical techniques aimed at predicting the consequences of mine closure and dealing with pollutant discharges. Contributions are invited on the following topics:

- Modelling of flows and water quality in underground mineworkings
- Hydrological and hydrogeochemical aspects of closure plans for open-pit mines
- Minewater pollution prevention strategies
- Hydrological and hydrogeochemical aspects of wetlands constructed to remediate minewater pollution.

#### HS16 **Hydrology and water resources in the Danube region**

Convener: **Dr. Günter Blöschl**, Institut f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801-3230, Fax: +43-1-5056212, E-mail:

G.BLOESCHL@EMAIL.TUWIEN.AC.AT

Co-Convener: **Prof. Dr. J. Szolgay**, Dept. of Land and Water Resources Management, Slovak Technical University, Radlinského 11, 813 68 Bratislava, Slovakia; Tel: +42-7-323-575, Fax: +42-7-323-575, E-mail: szolgay@cvt.stuba.sk

Managing water resources in large scale and transboundary river basins required improved methods for quantifying components of the hydrologic cycle at a regional scale. This session will focus on the understanding of the space-time variability of hydrologic processes including, but not limited to, precipitation, flooding, droughts and subsurface flow. Novel approaches to regionalisation and/or scaling of components of the water balance and other hydrologic characteristics are encouraged. The scope of the session includes both case studies in the Danube region and general methodological contributions applicable to large river basins. A keynote presentation will be given by a representative of the "Regional Cooperation of the Danube Countries in the Frame of IHP of UNESCO".

#### HS17 **Seepage from open channels**

Convener: **Prof. Dr. Alfred Paul Blaschke**, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801-3215, Fax: +43-1-505-6212, E-mail: BLASCHKE@BIMB.TUWIEN.AC.AT

Scope of session:

- Indirect and direct field measurements of seepage
- Interpretation of effects of clogging on stream-aquifer interactions (yield of pumping wells, pattern of flow paths)
- Analytical and numerical models of seepage
- Theory of river bed clogging
- Filtration (e.g. sand filters)
- Chemical and biological processes in the stream bed sediment
- Sedimentology of open channels
- Models of inter-grain particle transport



**HS18/NP1.2** **Scaling, fractals and nonlinearity in hydrology**  
 Convener: **Dr. Christian Onof**, Department of Civil Engineering, Imperial College, Prince Consort Road, London SW7 2BZ, United Kingdom; Tel: +44-171-594-6006, Fax: +44-171-594-6042, E-mail: C.ONOF@IC.AC.UK  
 Co-Conveners: **Jonas Olsson**, Dept. of Water Resources Engineering, University of Lund, Box 118, Solvegatan 13, 22100 Lund, Sweden; Tel: +46-46-222-8995, Fax: +46-46-222-4435, E-mail: JONAS.OLSSON@TVRL.LTH.SE  
**Prof. Dr. Thomas M. Over**, Department of Civil Engineering, MS 3136, Texas A & M University, College Station, TX 77843-3136, USA; Tel: +1-409-845-9709, Fax: +1-409-845-6156, E-mail: T-OVER@TAMU.EDU  
**Prof. Dr. Daniele Veneziano**, Room 1-348, MIT - Department of Civil and Environmental Engineering, 77 Mass. Ave., Cambridge, MA 02139-4307, USA; Tel: +1-617-253-7199, Fax: +1-617-253-6044, E-mail: VENEZIAN@MIT.EDU

All fields related to hydrological processes are highly variable. Conventional methods often fail to reflect adequately this fundamental feature at all temporal and spatial scales. Fractals and especially multifractals have already shown their great potential for modelling the variability and intermittency with the help of various scale invariant properties and exponents. This session will be devoted to the most recent theoretical and operational developments and applications of multifractal approaches to characterize hydrological media and to model rainfall, surface and groundwater processes.

## V. Biospheric Aspects of the Hydrological Cycle (BAHC)

**BAHC01 Interactions and feedbacks between the atmosphere and the terrestrial biosphere**  
 Convener: **Dr. Martin Claussen**, Potsdam Institute for Climate Impact Research (PIK), Postfach 601203, 14412 Potsdam, Germany; Tel: +49-331-288-2543, Fax: +49-331-288-2547, E-mail: BAHC@PIK-POTSDAM.DE

Interactions and feedbacks between the atmosphere and the terrestrial biosphere addresses both the climate drivers and response of the biosphere in terms of the structure, composition and distribution of vegetation, and the biosphere controls of regional and global climate.

**BAHC02 Integrated biosphere-atmosphere experiments: boreal and arctic region - northern Eurasia studies**  
 Convener: **Prof. Dr. E.D. Schulze**, Dept. of Plant Physiology, Universität Bayreuth, 95448 Bayreuth, Germany; Tel: +49-921-552570, Fax: +49-921-552564

Integrated biosphere-atmosphere experiments are aimed at providing an understanding of the interactions between the physical, biological and social systems.

**BAHC03 Mountain eco-hydrology**  
 Convener: **Dr. Alfred Becker**, Institut f. Meteorologie, Potsdam Institute for Climate Impact Research (PIK), Postfach 601203, 14412 Potsdam, Germany; Tel: +49-331-288-2543, Fax: +49-331-288-2547, E-mail: BECKER@PIK-POTSDAM.DE

Mountain eco-hydrology addresses the biospheric aspects of mountain hydrology and how the biosphere interacts with the physical environment.

## VI. Oceans and Atmosphere (OA)

**OA1 Open session on ocean circulation: physics of water mass transformation**  
 Convener: **Dr. Claus Böning**, Institut für Meereskunde, Universität Kiel, Düsternbrooker Weg 20, 24105 Kiel, Germany; Tel: +49-431-597-3885, Fax: +49-331-565-876, E-mail: CBOENING@IFM.UNI-KIEL.DE  
 Co-Conveners: **Dr. Svein Osterhus**, University of Bergen, Nordic WOCE Project Office, Allegt. 70, 5007 Bergen, Norway; E-mail: svein@gfi.uib.no

The session will include papers and posters (observations and modelling) on the dynamics of convection, the physics of overflows, the spreading and mixing of newly ventilated water and the role of these processes in the large-scale thermohaline circulation.

**OA2 Open session on coastal/shelf sea dynamics**  
 Convener: **Dr. Andreas Lehmann**, Institut für Meereskunde, Universität Kiel, Düsternbrooker Weg 20, 24105 Kiel, Germany; Tel: +49-431-597-4013, Fax: +49-431-565-876, E-mail: ALEHMANN@IFM.UNI-KIEL.DE

The session likes to provide a forum for discussions on mesoscale dynamics related to the Mediterranean, the North Sea and the Baltic Sea and other European shelf seas. Contributions may describe relevant field observations, or results obtained by numerical, analytical or laboratory modelling and may address questions related to circulation, mesoscale dynamics, mixed layer dynamics, water mass formation as well as effects of ice cover and sea ice dynamics in coupled ice-ocean models. A special part of the session will focus on turbulent mixing processes. Contributions dealing with investigations of physical processes maintaining stratification, and vertical mixing and advection leading to a redistribution of temperature and salinity are strongly encouraged.

**OA3 Circulation and water mass transformation in the Mediterranean**  
 Convener: **Prof. Alex Lascaratos**, Dept. of Applied Physics, University of Athens, 33 Ippokratous Str., 10680 Athens, Greece; Tel: +30-1-361-3504, Fax: +30-1-360-8518, E-mail: alasc@pelagos.ocean.uoa.ariadne.t.gr

Co-Convener: **Prof. Michel Crepon**, LODYC, Université Pierre & Marie Curie, 4 Place Jussieu, 75252 Paris Cedex 05, France; Tel: +33-1-44277274, Fax: +33-1-44277159, E-mail: MC@LODYC.JUSSIEU.FR

Issues related to the general circulation and water mass transformation in the Mediterranean will be addressed in this session. Contributions may come from relevant field observations, remote sensing or numerical models. More specifically the issues addressed may include:

- Seasonal and/or interannual variability of the general circulation.
- Water mass formation and spreading of intermediate and deep waters.
- The large scale thermohaline circulation.
- The role of straits in the general circulation of the Mediterranean (Gibraltar, Sicily, Otranto etc.).

#### OA4 The low-latitude oceans

Convener: **Prof. Dr. Friedrich Schott**, Institut für Meereskunde, Universität Kiel, Düsternbrookweg 20, 24105 Kiel, Germany; Tel: +49-431-597-3820, Fax: +49-431-597-3821, E-mail: FSCHOTT@IFM.UNI-KIEL.DE

Co-Convener: **Dr. Gilles Reverdin**, GRGS, CNES, 18, Avenue E. Belin, 31055 Toulouse Cedex, France; Tel: +33-61332926, Fax: +33-61253205, E-mail: REVERDIN@PONTOS.CST.CNES.FR; *after 18 October 1996* Tel: +33-5-61332926, Fax: +33-5-61253205

Presentations are invited on field studies and model results concerning the circulation of the tropical oceans and related variability. Particularly welcome are results

- from recent WOCE observations in the low-latitude Indian and Atlantic oceans;
- on the cross-equatorial transfer of mass and water mass properties.

#### OA5 Modelling large scale marine systems on High Performance Computers: a challenge for hydrodynamics, ecology and scientific computing

Convener: **Prof. Dr. Jean E. Berlamont**, Dept. Civil Engrg., Hydraulics Laboratory, de Croylaan 2, 3001 Heverlee, Belgium; Tel: +32-16-321-660, Fax: +32-16-321-989, E-mail: jean.berlamont@bwk.kuleuven.ac.be

Co-Convener: **Edwin A.H. Vollebregt**, Fac. TWI/TA, Delft University of Technology, P.O. Box 5031, 2600 GA Delft, The Netherlands; Tel: +31-15-278-5805, Fax: +31-15-278-7209, E-mail: EDWIN@PA.TWI.TUDELFT.NL

In order to arrive at a sustainable development of seas and oceans, taking into account both economical and ecological constraints, it is most useful to have a mathematical model available that is able to evaluate the effect of natural and anthropogenic changes to seas and oceans (ecological model). To model such large scale marine systems e.g. the North West European Shelf or the Mediterranean, on sufficiently small time and

space scales to be able to model the interactions between hydrodynamics, chemistry and biology (ecological processes), one necessarily has to use High Performance Computing techniques (e.g. parallelization).

In order to build real "ecological models" (of which actually only very few examples of limited space scale exist), which describe all (?) the coupled hydrodynamic, chemical and biological processes in a sea or an ocean, it is necessary to work in an interdisciplinary way to combine hydrodynamics, meteorology (one of the driving forces), biology and (not at least) scientific computing. Experience has shown that it is actually not always easy to make scientists of so many and various disciplines work together. The symposium would focus on examples of multidisciplinary projects, collect the experience gained, identify problems risen and their solutions, and try to establish future cooperations.

#### OA6/G6 Ocean modelling from altimetry and remote sensing

Convener: **Dr. Per Knudsen**, Geodetic Division, National Survey and Cadastre Denmark, Rentemestervej 8, 2400 Copenhagen NV, Denmark; Tel: +45-3587-5318, Fax: +45-3587-5052, E-mail: PK@KMS.MIN.DK

Co-Convener: **Dr. Pierre Yves Le Traon**, CLS, Space Oceanography Division, CNES, 18, Avenue E. Belin, 31055 Toulouse Cedex, France; Tel: +33-61281689, Fax: +33-61281832, E-mail: LETRAON@METIS.CNES.FR; *after 18 October 1996* Tel: +33-5-61281689, Fax: +33-5-61281832

This session will cover aspects of modelling the ocean dynamics using satellite altimetry and other remote sensing data. Contributions should focus on the implementation and use of inversion and assimilation techniques and on the comparison of remote sensing data with models and/or in-situ data. Results that quantitatively describe the contribution of altimetry and remote sensing data in modelling or understanding the ocean dynamics (El Nino events, large scale and mesoscale oceanic circulation, ocean tides, etc.) are of high interest.

#### OA7 Continental anthropogenic impact on coastal marine sediments

Convener: **Prof. Dr. Stephan Kempe**, Geologisch-Paläontologisches Institut, Technische Hochschule Darmstadt, Schnittspahnstr. 9, 62485 Darmstadt, Germany; Tel: +49-6151-16-2471, Fax: +49-6151-16-6539, E-mail: KEMPE@BIO1.BIO.TH-DARMSTADT.DE

The anthropogenic impact on coastal sediments can be documented either by changes in the input (i.e. by analyzing long-term records of fluvial sediment transport or morphological changes in estuaries and deltas) or by changes in the properties and mass balances of the coastal sediments themselves (i.e. by analyzing sediment cores or mapping geochemical, mineralogical, sedimentological or biological properties in the coastal

zone or by analyzing the morphological response to changing sediment availability, estuary shapes, increasing sea level or changed carbonate production).

#### **OA8 Intercomparison and validation of the ocean-atmosphere flux fields**

Convener: **Dr. Sergey Gulev**, Shirshov Institute of Oceanology, Russian Academy of Sciences, Krasikova 23, 117218 Moscow, Russia; Tel: +7-095-124-7985, Fax: +7-095-124-5983, E-mail: ROCC@SOVAM.COM

Co-Convener: **Prof. Kristina Katsaros**, Dept. d'Océanographie Spatiale, IFREMER, B.P. 70, 29280 Plouzané, France; Tel: +33-98224316, Fax: +33-98224533, E-mail: KATSAROS@IFREMER.FR; *after 18 October 1996* Tel: +33-2-98224316, Fax: +33-2-98224533

This special session will review the status of our knowledge of the reliability and accuracy of fluxes of momentum, thermal energy and mass across the air sea interface, available from data collected on voluntary observing ships, in field experiments, by remote sensing from space or from reanalyses of numerical weather prediction models. Our focus is on parameterizations schemes and data processing techniques used for climate research and model simulations. Special attention will be paid to the decades of the 1980s and 1990s, which provide an overlap between different data sources and therefore an exceptional opportunity to establish links between different methods and data types by performing cross-validations and intercomparisons. We hope to discuss a strategy for the creation of unbiased climatologies of sea-air exchange parameters, that will be acceptable both to researchers involved in creating the climatologies and to the users.

For this session we invite participation by scientists occupied in the different domains related to sea-air flux estimation: sea-air flux climatology from voluntary observing ships, satellite remote sensing, sea-air flux parameterization, model intercomparison, operational flux products and numerical model reanalyses. We invite participation by specialists in data assimilation, who are dealing with different sources of sea-air flux estimates. Topical studies related to the energy budgets of the enclosed and semi-enclosed seas and sea-air interaction field experiments (TOGA/COARE, SOFIA/ASTEX, SEMAPHORE) are especially welcome. Contributions focussed on the interannual and decadal variability of the forcing fields will be also of a great interest.

#### **OA9/ST21 Biogenic air-sea fluxes and processes in coastal and marginal seas**

Convener: **Dr. Patrick Buat-Menard**, Dept. de Géologie et Océanographie, Université de Bordeaux I, Avenue des Facultés, 33405 Talence Cedex, France; Tel: +33-5684-8870, Fax: +33-5684-0848, E-mail: BUAT@GEOCEAN.U-BORDEAUX.FR; *after 18 October 1996* Tel: +33-5-5684-8870, Fax: +33-5-5684-0848

Co-Convener: **Prof. Nicholas J.P. Owens**, Dept. of Marine Sciences and Coastal Management, University of Newcastle upon Tyne, Ridley Building, Newcastle upon Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-8885, Fax: +44-191-222-7891, E-mail: n.owens@newcastle.ac.uk

Coastal zones are active sources and sinks of carbon dioxide and several biologically reactive gases (for example: nitrous oxide, methane, halo-carbons, sulfur compounds etc.). These gases are of significance in both a biogeochemical sense (e.g. sulphur gases produced in the coastal zone may be a significant source of sulphur for the terrestrial environment) and in influencing the composition of the atmosphere (e.g. nitrous oxide and methane are greenhouse gases). There are indications that the fluxes of many of these gases in the coastal zone are of sufficient magnitude to be of global significance. Thus, an understanding of the role of the coastal zone as sources or sinks of biogases (and possible feedbacks) is essential in the context of global change. The aim of this workshop is to bring together all the issues of relevance to this subject in the context of ongoing national and international research efforts.

The workshop will focus on:

- identification of the gases of importance in the coastal zone and their inventories in a global context,
- biological sources and sinks in the coastal zone and possible feedbacks,
- physical controls on source and sinks and transfer mechanisms between the aquatic and terrestrial ecosystems and the atmosphere,
- future research needs.

#### **OA10/ST22**

##### **Sulphur cycle in the marine atmosphere**

Convener: **Karsten Suhre**, Lab. d'Aérologie, UMR CNRS/UPS 5560, Observatoire Midi-Pyrénées, 14, Ave. E. Belin, 31400 Toulouse, France; Tel: +33-61332754, Fax: +33-61332790, E-mail: SUHK@AERO.OBS-MIP.FR; *after 18 October 1996* Tel: +33-5-61332754, Fax: +33-5-61332790  
Co-Convener: **Dr. Harald Berresheim**, Deutscher Wetterdienst, Albin-Schwaiger-Weg 10, 82383 Hohenpeissenberg, Germany; Tel: +49-8805-9200-44, Fax: +49-8805-9200-46, E-mail: HARALD@MOHP.DWD.D400.DE

The role of sulphate aerosol particles in radiative forcing, particularly in the marine atmosphere, presents a major uncertainty in present climate models. This calls for a better understanding of the budget and the chemical and physical processing of sulphur in the marine atmosphere. The scope of this session should include and up-to-date overview of relevant processes in the marine environment such as DMS emission, DMS oxidation, sulphate particle formation and growth, cloud cycling, dry and wet deposition, and transport processes. Presentations of laboratory and field measurements including remote sensing as well as of model simulations are solicited.

**OA11/ Open session on mesoscale studies**

**ST19 01 Mesoscale meteorology**

Convener: **Dr. Gerhard Adrian**, Institut f. Meteorologie & Klimaforschung, Forschungszentrum Karlsruhe, Postfach 36 40, 76021 Karlsruhe, Germany; Tel: +49-7247-82-2844, Fax: +49-7247-82-4742, E-mail: ADRIAN@IMKHP3.FZK.DE and ADIRAN@IMK.FZK.DE

Co-Convener: **Dr. Yvon Lemaitre**, CNET/CRPE, 38-40, rue General Leclerc, 92141 Issy-les-Moulineaux, France; Tel: +33-1-39253916, Fax: +33-1-39254778, E-mail: LEMAITRE@CETP.IPSL.FR

The objective of this session is to discuss mesoscale processes and phenomena. Developments of analysis tools are also included like observations and modelling. Papers presenting results from past field experiments and plans for future experimental work are invited.

The main emphasis is on fundamental dynamics of mesoscale processes like orographic flow, thermally induced circulations mid latitude and tropical cyclones or deep convection. Papers on tools and developments of numerical weather prediction should be submitted to the Numerical Weather prediction session.

**02 Mesoscale transport of pollutants**

Convener: **Prof. Dr. Eberhard H. Schaller**, Lehrstuhl für Umweltmeteorologie, Brandenburgische Technische Universität, Postfach 10 13 44, 03013 Cottbus, Germany; Tel: +49-355-7813-186, Fax: +49-355-7813-132, E-mail: schaller@umwelt.tu-cottbus.de

Co-Convener: **Dr. Torben Mikkelsen**, Department of Meteorology and Wind Energy, Meteorological Division, Risø Forskningscenter, P.O. Box 49, 4000 Roskilde, Denmark; Tel: +45-46-775009, Fax: +45-46-755619, E-mail: met-tomi@risoe.dk

**OA12/ Open session on turbulent boundary layers**

**ST18 01 Basic turbulent studies**

Convener: **Dr. Arakel Petrosyan**, Space Research Institute, Profsoyuznaya Ulitsa 84/32, 117810 Moscow, Russia; Tel: +7-095-333-3011, Fax: +7-095-310-7023, E-mail: APETROSY@ESOC1.BITNET

Co-Convener: **Dr. Thomas Gerz**, Institut f. Physik der Atmosphäre, DLR Oberpfaffenhofen, Postfach 11 16, 82230 Wessling, Germany; Tel: +49-8153-28-1333, Fax: +49-8153-28-1841, E-mail: thomas.gerz@dlr.de

Main goal of this symposium is to characterize turbulence and the mixing and stirring properties of geophysical flow regimes at various scales in the oceans and in the atmosphere. Interaction of small-scale turbulence with non-turbulent motions like waves and currents will be discussed. Importance will be attached to the problem of proper, scale-

dependent parameterization of turbulence and mixing processes for flow dynamics at larger scales (boundary-layer flows, interfacial flows, free flows, global-scale dynamics). Modelling, theoretical and observational papers on these topics of geophysical turbulence will be encouraged.

**02 Studies of atmospheric surface fluxes (Co-sponsored by BAHC)**

Convener: **Dr. Thomas Foken**, Meteorologisches Observatorium Lindenberg, Deutscher Wetterdienst, Schulstr., 15864 Lindenberg, Germany; Tel: +49-33677-60-228, Fax: +49-33677-60-280, E-mail: FOKEN@MOL.DWD.D400.DE

Co-Convener: **Dr. Riccardo Valentini**, Dept. of Forest Science and Environment, Università di Tuscia, Via S Camillo de Lellis, 01100 Viterbo, Italy; Tel: +39-761-357394, Fax: +39-761-357389, E-mail: RIK@UNITUS.IT

Measurement and parametrization of turbulent fluxes of momentum, sensible and latent heat and gaseous compounds are the topics of the session. It is mainly addressed on fundamental and methodical problems. These are new measuring methods, correction and quality control procedures, flux parameterizations and so on. Also the comparison of experimental data and model outputs will be discussed as well as problems of measurements over different surfaces and the determination of area averaged fluxes.

**03 Atmospheric boundary layer studies**

Convener: **Dr. Jorgen Hojstrup**, Dept. of Meteorology and Wind Energy, Meteorological Division, Risø Forskningscenter, P.O. Box 49, 4000 Roskilde, Denmark; Tel: +45-4677-5020, Fax: +45-4675-5619, E-mail: JORGEN.HOJSTRUP@RISOE.DK

Co-Convener: **Dr. Ulrich Corsmeier**, Institut f. Meteorologie & Klimaforschung, Forschungszentrum Karlsruhe, Postfach 36 40, 76021 Karlsruhe, Germany; Tel: +49-7247-822-843, Fax: +49-7247-824-742, E-mail: ulrich.corsmeier@imk.fzk.de

**Dr. Petra Seibert**, Institut f. Meteorologie und Physik, Universität Wien, Türkenschanzstr. 18, 1180 Wien, Austria; Tel: +43-1-36026-2410, Fax: +43-1-36025-74, E-mail: SEIBERT@ZAMG.AC.AT

Papers are invited which focus on the development of turbulent atmospheric boundary layer in general. Processes and phenomena which are of fundamental importance for the diurnal cycle of the boundary layer height and its internal structure over homogeneous as well as nonhomogeneous terrain should be presented. Examples of the space scales under consideration reach from the investigation of single hill-valley systems to the aggregated influence of large and very complex landscape structures. The role of the surface energy balance in the boundary layer devel-

opment on the one hand and the processes affecting the transition zone between the boundary layer and the free atmosphere, like entrainment, and mountain-, cloud- and advective-venting on the other hand should be discussed. Results from experimental, model and theoretical investigations are requested.

#### OA13 Atmospheric convection

Convener: **Prof. Dr. Michael Hantel**, Institut f. Meteorologie und Geophysik, Universität Wien, Hohe Warte 38, 1190 Wien, Austria; Tel: +43-1-36026-3001, Fax: +43-1-3685-612, E-mail: MICHAEL.HANTEL@UNIVIE.AC.AT

Co-Conveners: **Dr. Jean-Luc Redelsperger**, METEO France, CNRM, 42, Avenue G. Coriolis, 31057 Toulouse, France; Tel: +33-61079475, Fax: +33-61079626, E-mail: REDELS@METEO.FR; *after 18 October 1996* Tel: +33-5-61079475, Fax: +33-5-61079626

**Prof. Dr. Eberhard H. Schaller**, Lehrstuhl für Umweltmeteorologie, Brandenburgische Technische Universität, Postfach 10 13 44, 03013 Cottbus, Germany; Tel: +49-355-7813-186, Fax: +49-355-7813-132, E-mail: SCHALLER@UMWELT.TU-COTTBUS.DE

**Prof. Dr. Reinhold Steinacker**, Institut f. Meteorologie und Geophysik, Universität Wien, Silbergasse 45/7, 1190 Wien, Austria; Tel: +43-1-3681-1371, Fax: +43-1-369-8127, E-mail: REINHOLD.STEINACKER@UNIVIE.AC.AT

The symposium invites papers about how to quantify convective processes from the Earth's surface up into the free atmosphere. This includes boundary layer convection and deep convection alike and concerns the problem of scale interaction in the vertical, including the problem to what extent convective processes are forced or modified by orography. Is there an optimum measure of the potential for, and the actual intensity of, convection (e.g., thunder frequency, thermodynamic stability indices, OLR, eddy flux)? Reports on observational strategies (radar, satellite, sferics location systems, enhanced automatic networks), diagnostic techniques (particularly those which make use of routine meteorological observations) and numerical methods (e.g., cloud resolving models) to identify convective activity might be considered. Emphasis should be less on parameterization/forecast but more on observational/diagnostic aspects, in order to improve our understanding of physics of atmospheric convection. Contributions within the frame of the forthcoming MAP (Mesoscale Alpine Programme) are especially welcome.

#### OA14 Numerical weather prediction

Convener: **Mr. Nils Gustafsson**, Swedish Meteorological and Hydrological Institute (SMHI), Folkborgsvägen 1, 60176 Norrköping, Sweden; Tel: +46-11-158165, Fax: +46-11-170207, E-mail: NGUSTAFSSON@SMHI.SE

Co-Conveners: **Dr. Bruce Macpherson**, NWP Development, Room R343, Meteorological Office, London Road, Bracknell, Berkshire RG12 2SZ, United Kingdom; Tel: +44-1344-856490, Fax: +44-1344-854026, E-mail: BMACPHERSON@METO.GOV.UK

**Dr. Jens Sunde**, Research Department, Norwegian Meteorological Institute, P.O. Box 43, 0313 Oslo 3, Norway; Tel: +47-22-963332, Fax: +47-22-963050, E-mail: jens.sunde@dnmi.no

The scope of the session is to review current research, development and operational aspect of Numerical Weather Prediction (NWP), giving particular attention to the use of observations. Contributions related to data assimilation and observation impact studies are invited. Papers on the use of observations (both remotely sensed and conventional) in nowcasting, very short range forecasting and high resolution NWP are particularly welcome. Contributions related to numerical techniques, high resolution modelling and practical application of model output are also invited.

#### OA15/ HS10

#### The integration of meteorological model forecasts into real-time flood forecasting systems

Convener: **Dr. Michael Bruen**, Department of Civil Engineering, Centre for Water Resources Research, University College, Earlsfort Terrace, Dublin 2, Ireland; Tel: +353-1-706-7378, Fax: +353-1-706-7399, E-mail: mbruen@iveagh.ucd.ie

Co-Conveners: **Prof. Nils Roar Saelthun**, Norwegian Institute for Water Research, P.O. Box 173, Kjelsaas, 0411 Oslo, Norway; Tel: +47-22-185100, Fax: +47-22-959201, E-mail: NILS.SAELTHUN@NIVA.NO

**Prof. Franco Siccaldi**, Institute of Hydraulics, Università di Genova, Via Montallegro 1, 16145 Genova, Italy; Tel: +39-10-3532496, Fax: +39-10-3532481, E-mail: franco@idra.unige.it

**Prof. Ezio Todini**, Dept. of Earth and Geo-Environmental Sciences, Università di Bologna, Via Zamboni 67, 40127 Bologna, Italy; Tel: +39-51-354-537, Fax: +39-51-354-522, E-mail: ETEP@ETEP.DSNET.IT

Floods can be forecast on the basis of telemetered data, e.g. precipitation, a catchment and water levels and flows in its channel network. However there is an upper limit on the useful forecast lead-time, which is determined by the response time of the catchment. Depending on the purposes of the flood forecast this upper limit may greatly diminish the usefulness of the forecast. Attempts can be made to extend the overall forecast lead time by including a forecast of meteorological conditions together with predictions of their consequences using hydrological and hydraulic models in an overall flood forecasting system. Radar observation of the approaching storm may also be used as an intermediate update on or confirmation of the unfolding meteorological scenario. The great differences in both time and space scales between meteorological and hydrological models means that their integration into a single flood forecasting system

is not an easy task. On the one hand progress must be made on reducing the useful resolution of the meteorological models to match the space and time scales of catchments. On the other hand, catchment models must be able to utilize the spatial and temporal characteristics of precipitation forecasts which such meteorological models are expected to provide. This session focusses on both aspects of this important topic. It examines progress made with meteorological models, especially the high resolution, limited area models. This includes adequate parameterisation of the processes important for precipitation generation. It also deals with appropriate hydrological and hydraulic models for forecasting with distributed inputs. Papers dealing with these issues and with the integration of both types of model and which offer insights into the modelling scale/performance trade-offs are welcome. Papers dealing with the verification, updating (using observations) and post-hoc assessment of forecasts and the quantification of uncertainties and with risk analysis are also invited.

**OA16/  
HS9**

#### **Hydrology of mountainous regions**

Convener: **Dr. Robert Kirnbauer**, Institut f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801-3220, Fax: +43-1-5056212, E-mail: RKIRNBAU@FEST1.TUWIEN.AC.AT

Co-Conveners: **Dr. Ludwig N. Braun**, Kommission f. Glaziologie der Bayer. Akademie der Wissenschaften, Marstallplatz 8, 80539 München, Germany; Tel: +49-89-23031-196, Fax: +49-89-23031-100, E-mail: LUDWIG.BRAUN@LRZ.BADW-MUENCHEN.DE

**Prof. Dieter Gutknecht**, Inst. f. Hydraulik, Gewässerkunde und Wasserwirtschaft, Technische Universität Wien, Karlsplatz 13/223, 1040 Wien, Austria; Tel: +43-1-58801/3222, Fax: +43-1-5056212

**OA17**

#### **Glaciology of the Atlantic sector of Antarctica**

Convener: **Prof. Dr. Heinz Miller**, Alfred-Wegener-Institut f. Polar- und Meeresforschung, Postfach 12 01 61, Columbusstr., 27515 Bremerhaven, Germany; Tel: +49-471-4831-210, Fax: +49-471-4831-149, E-mail: MILLER@AWI-BREMERHAVEN.DE

Co-Conveners: **Dr. Helmut Rott**, Institut für Meteorologie und Geophysik, Universität Innsbruck, Innrain 52, 6020 Innsbruck, Austria; Tel: +43-512-507-5451, Fax: +43-512-507-2924, E-mail: HELMUT.ROTT@UIBK.AC.AT

**Dr. Dietmar Wagenbach**, Institut f. Umweltphysik, Universität Heidelberg, Im Neuenheimer Feld 366, 69120 Heidelberg, Germany; Tel: +49-6221-546305, Fax: +49-6221-546405

**OA18**

#### **Physically-based snow models and their links to GCMs**

Convener: **Dr. Eric Brun**, Centre d'Etudes de la Neige, METEO FRANCE, CNRM/CEN, 1441, rue de la Piscine, 38406 Saint Martin d'Heres Cedex, France; Tel: +33-7663-7901, Fax: +33-7651-5346, E-mail: eric.brun@meteo.fr; *after 18 October 1996* Tel: +33-4-7663-7901, Fax: +33-4-7651-5346

Recent works have highlighted the important role played by the snow cover on the Earth's climate. Snow has original physical properties which differ very much from other surfaces. To improve the representation of snow in GCMs, new parameterisations are developed with an increased sophistication. Some of them become similar to physically based snow models developed for snow science or for hydrology.

The session aims at presenting papers and exchanging ideas on snow modelling as well from the climate point of view as from the snow point of view.

**OA19**

#### **Snow and ice chemistry of alpine and polar regions**

Convener: **Prof. Dr. Michael Kuhn**, Institut f. Meteorologie u. Geophysik, Universität Innsbruck, Innrain 52, 6020 Innsbruck, Austria; Tel: +43-512-507-5450, Fax: +43-512-507-2924,

Co-Convener: **Dr. Robert J. Delmas**, CNRS, Lab. de Glaciologie et Géophysique d'Environnement, 54, rue Molière, BP 96 Domaine Universitaire, 38402 St.-Martin-d'Heres Cedex, France; Tel: +33-76824265, Fax: +33-76824201, E-mail: DELMAS@GLACIOG.GRENET.FR; *after 18 October 1996* Tel: +33-4-76824265, Fax: +33-4-76824201

**OA20/  
ST20**

#### **Storm track and cyclone variability**

Convener: **Dr. Uwe Ulbrich**, Institut für Geophysik und Meteorologie, Kerpener Str. 13, 50923 Köln, Germany; Tel: +49-221-470-3688, Fax: +49-221-470-5161, E-mail: ULBRICH@METEO.UNI-KOELN.DE

Co-Convener: **Dr. Paul J. Valdes**, Dept. of Meteorology, University of Reading, 2 Earley Gate, Whiteknights, Reading, Berks. RG6 2AU, United Kingdom; Tel: +44-1734-316517, Fax: +44-1734-352604, E-mail: P.J.VALDES@READING.AC.UK

This session will assess the variability in the intensities and positions of the mid-latitude storm tracks and of the related paths and development of extratropical cyclones. Papers studying statistical approaches and investigations on the controlling mechanisms are sought. Observational results, GCM studies for the present, past and future climates are welcome. Presentations on the growth of disturbances in an idealized environment are also encouraged.



**OA21/  
G11 Measuring and modelling atmosphere-ocean-  
land interactions**

Convener: **Dr. Pascal Gegout**, Institut de Physique du Globe de Strasbourg, 5, Rue Rene Descartes, 67084 Strasbourg, France; Tel: +33-88416694, Fax: +33-88416477, E-mail: PASCAL@SELENE.U-STRASBG.FR and GEGOUT@SC2000.CNES.FR; *after 18 October 1996* Tel: +33-3-88416694, Fax: +33-3-88416477  
Co-Conveners: **Prof. Dr. Steven R. Dickman**, Dept. of Geology, State University of New York at Binghamton, P.O. Box 6000, Binghamton, NY 13902-6000, USA; Tel: +1-607-777-2857, Fax: +1-607-777-2288, E-mail: DICKMAN@BINGVMB.CC.BINGHAMTON.EDU  
**Dr. Katia Laval**, Lab. de Meteorologie Dynamique, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-44322244, Fax: +33-1-43368392, E-mail: LAVAL@LMD.ENS.FR

This symposium is devoted to the modelling and the measuring of interactive processes between the Atmosphere, Oceans, and Solid Earth which lead to global mass redistribution and angular momentum exchange. Atmospheric winds and pressure variations induce oceanic currents and changes in sea level, and cause crustal load deformations. This session will explore the models relating such atmospheric forcing to the oceanic and crustal responses, on time scales ranging from daily to geological, as determined locally, regionally, and globally. Processes that focus on the dynamic or static response of the oceans, and the gravito-elastic or visco-elastic response of the solid Earth are among those that will be investigated. This session will also explore geodetic methods of measurement of the state of the atmosphere, oceans and solid earth, and observations associated with the interactions. This session will also focus on the estimation of oceanic angular momentum (OAM) and atmospheric angular momentum (AAM), and their implications for variations in Earth's rotation.

**OA22/  
HS7 Hydrological, oceanic and atmospheric processes governing heat and mass balances at northern latitudes: experiences from NOPEX and BALTEX (Co-sponsored by BAHC)**

Convener: **Prof. Sven Halldin**, NOPEX Central Office, Institut of Earth Sciences/Hydrology, University of Uppsala, Norbyvägen 18 B, 752 36 Uppsala, Sweden; Tel: +46-18-182262, Fax: +46-18-551124, E-mail: sven.halldin@hyd.uu.se  
Co-Convener: **Dr. Mikko Alestalo**, Meteorological Research, Finnish Meteorological Institute, P.O. Box 503, 00101 Helsinki, Finland; Tel: +358-0-192-9400, Fax: +358-0-179-581, E-mail: MIKKO.ALESTALO@FMI.FI

One of the largest uncertainties in present-day GCMs for predicting the future climate relates to the parameterisation of water, heat, and carbon budgets at local to continental scales at the interfaces between land, air and sea. Coordination of major experimental efforts required to solve these problems are central themes for

WCRP/GEWEX and IGBP/BAHC. NOPEX (a Northern hemisphere climate Processes land-surface EXperiment) has established a new format for the meso-scale land-surface experiments by integrating hydrology and meteorology as well as intensive, long-term, and local field studies with a really-covering time-limited field studies. The BALTEX project is unique by its combination of both hydrology, oceanography, and meteorology in a single experiment delimited by the entire catchment area of the Baltic Sea. The NOPEX region is centred in the middle of the BALTEX (The Baltic Sea EXperiment) region. The main objective of both NOPEX and BALTEX are to describe and explain the budgets of water and heat over their respective regions.

The intention of this session is to utilize the synergistic potential in multi-disciplinary projects like NOPEX and BALTEX to jointly discuss the results of the projects. It specifically aims at providing results from the Concentrated Field Efforts in 1994 and 1995, and from the Continuous Climate Monitoring programme of NOPEX, and from the initial phases of the different working groups in BALTEX (e.g. the PIDCAP experiment). Contributions from similar experiments (GCIP, BOREAS, HAPEX-Sahel, etc.) are also welcome.

The specific goals of the BALTEX are: BALTEX will explore, model and quantify the various processes determining the space and time variability of the energy and water cycle of the Baltic Sea and its catchment area. BALTEX will undertake specific assessments of the total flux divergence of heat, water and momentum for this region and determine its coupling to the large-scale atmospheric circulation and to the water exchange through the Danish Straits. The scientific objectives will be addressed by a combined observational and modelling approach where the Baltic Sea, the land surfaces of its catchment area and the atmosphere will be considered as one system.

**OA23 Climate variability: observations and modelling**

**01 Atmospheric and oceanic processes in climate studies**

Convener: **Dr. Hervé Le Treut**, Lab. de Meteorologie Dynamique du CNRS, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-4432-2237, Fax: +33-1-43368392, E-mail: LETREUT@LMD.ENS.FR

**02 Seasonal to interannual variability: tropical climate predictions**

Convener: **Dr. Julia M. Slingo**, Centre for Global Atmospheric Modelling, Department of Meteorology, University of Reading, 2 Earley Gate, Whiteknights, Reading, Berks. RG6 2AU, United Kingdom; Tel: +44-1734-318424, Fax: +44-1734-318316, E-mail: J.M.SLINGO@READING.AC.UK



Co-Convener: **Dr. Katia Laval**, Lab. de Meteorologie Dynamique, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-44322244, Fax: +33-1-43368392, E-mail: LAVAL@LMD.ENS.FR

Variability on seasonal to interannual time-scales is a major focus of the new CLIVAR programme of the WCRP. In recent years understanding of climate variability on these timescales has increased dramatically, particularly for tropical regions. The potential for predictability is recognized in the developing programmes for seasonal forecasting and coupled modelling. Contributions are invited on all aspects of seasonal to interannual variability based on observational and modelling studies, where the models may be atmosphere, ocean or fully coupled models, and may be global or regional in scale. A particular focus of the symposium will be the potential for predictability in the tropics. Specific topics of interest include:

- Monsoon variability
- ENSO predictability
- Sahel drought prediction
- Predictability of seasonal hurricane/typhoon activity

### **03 Decadal variability: North Atlantic and Arctic climate**

Convener: **Dr. Mojib Latif**, Max-Planck-Institut für Meteorologie, Bundesstr. 55, 20146 Hamburg, Germany; Tel: +49-40-41173-248, Fax: +49-40-41173-298, E-mail: LATIF@DKRZ.DE

Co-Convener: **Dr. Antonio Navarra**, Istituto per le Metodologie Geofisiche Ambientali, CNR - IMGA, Via Emilia Est 770, 41100 Modena, Italy; Tel: +39-59-362-388, Fax: +39-59-374-506, E-mail: NAVARRA@RIGOLETTO.BO.CNR.IT

The session deals with all aspects of decadal climate variability. The investigation of decadal variability is a rapidly developing research topic, and the session aims to review the current level of understanding and observational evidence.

Theoretical, modelling and observational studies are welcome.

### **04 Coupled atmosphere-ice-ocean model developments**

Convener: **Dr. Serge Planton**, METEO FRANCE, CNRM, 42, Avenue G. Coriolis, 31057 Toulouse, France; Tel: +33-61079376, Fax: +33-61079610, E-mail: serge.planton@meteo.fr; after 18 October 1996 Tel: +33-5-61079376, Fax: +33-5-61079610

Co-Convener: **Dr. Ulrich Cubasch**, Deutsches Klimarechenzentrum GmbH, Bundesstrasse 55, 20146 Hamburg, Germany; Tel: +49-40-41173-297, Fax: +49-40-411-751, E-mail: CUBASCH@DKRZ.DE

The main scope of this symposium is to present the current status of the development of coupled atmosphere-ice-ocean models to be used in climate studies. This includes as well global climate models as regional models using relaxation to climate in the remaining part of the globe. The first topic concerns the presentation of the developments or improvements of the models by including new components of the climate system or a better representation of some physical processes. A second main topic is the verification of the models results by means of diagnostic tools and comparison to relevant observations.

Among some major issues or problems that could be addressed by the presentations, we can mention:

- the strategies and techniques for coupling the different model components
- the model initialization and the spin-up problem
- the impact of flux correction or other adjustment methods
- the simulated variability at different time and space scales
- the intercomparison of coupled models

### **05 Reconstruction of past climates through modelling and observations**

Convener: **Dr. Paul J. Valdes**, Dept. of Meteorology, University of Reading, 2 Earley Gate, Whiteknights, Reading, Berks. RG6 2AU, United Kingdom; Tel: +44-1734-316517, Fax: +44-1734-352604, E-mail: P.J.VALDES@READING.AC.UK

Co-Convener: **Dr. Gilles Ramstein**, Laboratoire de Modelisation du Climat et de l'Environnement, C.E. Saclay, Bat. 709 Orme des Merisiers, 91191 Gif-sur-Yvette Cedex, France; Tel: +33-1-69086495, Fax: +33-1-6908-7716, E-mail: RAMSTEIN@ASTERIX.SACLAY.CEA.FR

This session will discuss observations and modelling based studies of past climates and their variability. This includes studies of the recent past and more distant periods. Modelling work can include studies of the atmosphere, ocean, biosphere and/or cryosphere, and simulations of aspects of the coupled system are encouraged, as are palaeo-data studies of these components. Papers combining model and data studies are of particular interest, as are modelling and data studies related to the Palaeoclimate Model Intercomparison Project (PMIP). Work on pre-Quaternary climates, especially previous warm periods such as the Cretaceous, is also encouraged.

### **OA24/ ST16**

#### **Solar cycles and global climate variability**

Convener: **Prof. Giuliana Cini-Castagnoli**, Dipartimento di Fisica Generale, Università di Torino, Via P. Giuria 1, 10125 Torino, Italy; Tel: +39-11-6604066, Fax: +39-11-6604056, E-mail: CINI@ICG.TO.INFN.IT

Co-Convener: **Dr. Jean-Claude Duplessy**, Centre des Faibles Radioactivites, CNRS - CEA, Avenue de la Terrasse, 91198 Gif-sur-Yvette Cedex, France; Tel: +33-1-69823526, Fax: +33-1-69823568, E-mail: jean-claude.duplessy@cfr.cnrs-gif.fr

**OA25/  
ST2**

**Open session on the middle atmosphere**

Convener: **Dr. Martin Dameris**, Institut f. Physik der Atmosphäre, DLR Oberpfaffenhofen, Postfach 11 16, 82230 Wessling, Germany; Tel: +49-8153-28-1558, Fax: +49-8153-28-1841, E-mail: MARTIN.DAMERIS@DLR.DE  
Co-Convener: **Dr. Bernd C. Krüger**, DGR/LPAS, Ecole Polytechnique Federal de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5701, Fax: +41-21-693-3626, E-mail: BERND.KRUEGER@DGR.EPFL.CH

This session will include contributions on all aspects of radiative, chemical, and dynamical processes and their interaction governing the behaviour of the Earth Middle Atmosphere. Topics to be considered include experimental, theoretical, and numerical studies dealing with large or local scale dynamics, vertical and horizontal transfer, homogeneous and heterogeneous chemistry. Since there will be no special session on Stratospheric-Tropospheric Exchange and on the Impact of Aircraft Emissions on the Atmosphere, such papers will also be considered in this open session.

**OA26 GNSS-based atmospheric profiling and imaging**

Convener: **Dr. Gottfried Kirchengast**, Institut für Meteorologie und Geophysik, Karl-Franzens-Universität, Halbhärthgasse 1, 8010 Graz, Austria; Tel: +43-316-380-5260, Fax: +43-316-380-9825, E-mail: kirchengast@bkfug.kfunigraz.ac.at  
Co-Convener: **Dr. Per Hoeg**, Danish Meteorological Institute, Lyngbyvej 100, 2100 Copenhagen 0, Denmark; Tel: +45-39-157-486, Fax: +45-39-157-460, E-mail: HOEG@DMI.MIN.DK

The Global Positioning and Global Navigation Satellite Systems (GPS and GLONASS, generic GNSS) enable remote sensing of the atmosphere using the radio-occultation technique. Refractivity, pressure, temperature, and moisture can be derived with high resolution and accuracy in the tropo- and/or stratosphere over the entire globe. In the ionosphere, electron density can be deduced. The recent GPS/MET data indicate high potential benefits of the technique for weather and climate prediction and monitoring as well as ionospheric research.

Contributions are invited dealing with topical areas such as: atmospheric/ionospheric profiling methods, especially temperature and moisture retrieval and electron density retrieval; GNSS-based atmospheric/ionospheric imaging methods, especially 4D-VAR and tomographic techniques; technical error budgets; use of GPS/MET data or simulated data for topics like weather prediction, climate modelling studies, monitoring of climate

trends, hydrological cycle processes, gravity waves in the atmosphere, TIDs/irregularities in the ionosphere, ionospheric modelling.

**OA27/  
ST14**

**Global ozone**

Convener: **Dr. Michaela-Maria Hirschberg**, Lehrstuhl f. Bioklimatologie & Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weihenstephan, Germany; Tel: +49-8161-714-742, Fax: +49-8161-714-753, E-mail: mmh@atmos1.met.forst.uni-muenchen.de  
Co-Convener: **Prof. Dr. Peter Fabian**, Lehrstuhl f. Bioklimatologie und Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weihenstephan, Germany; Tel: +49-8161-714-740, Fax: +49-8161-714-753, E-mail: fabian@met.forst.uni-muenchen.de  
**Dr. Alexei A. Krivolutsky**, Central Aerological Observatory, 3 Pervomayskaya str., 141700 Dolgoprudny, Moscow Region, Russia; Tel: +7-095-576-3327, Fax: +7-095-57-63-327, E-mail: vvcao@sovam.com

The session will deal with ozone and its distribution in the atmosphere, as well as trace constituents related to ozone photochemistry. Main emphasis will be on the middle atmosphere, but papers on tropospheric ozone related to global aspects will also be considered for presentation.

Contributions dealing with field measurements, laboratory investigations and modelling are invited.

Special attention will be given to papers dealing with ozone losses and trends due to heterogeneous reactions on sulfate aerosols and PSCs at northern latitudes, and their impact on the UV radiation field.

We also wish to focus on solar radiation and particle effects on the ozone layer.

**OA28/  
ST23**

**Heterogeneous processes of ozone destruction in the stratosphere and troposphere**

Convener: **Dr. Andreas Wahner**, Institut f. Atmosphärische Chemie, ICG-3, Kernforschungszentrum Juelich, Postfach 1913, 52425 Jülich, Germany; Tel: +49-2461-61-5932, Fax: +49-2461-61-5346, E-mail: A.WAHNER@KFA-JUELICH.DE  
Co-Convener: **Dr. Michel J. Rossi**, LPAS-DGR, Ecole Polytechnique Federal de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5321, Fax: +41-21-693-3626, E-mail: MICHEL.ROSSI@DGR.EPFL.CH

The aim of this symposium is to discuss recent improvements in our understanding of heterogeneous processes relevant to atmospheric chemistry: Heterogeneous reactions in the atmosphere have been now recognized to play critical roles in many environmental issues (for example: polar stratospheric ozone depletion, chemistry in clouds/on aerosols in the upper and lower troposphere, chemistry in the wake of aircrafts). This symposium will cover heterogeneous chemistry of

the stratosphere and troposphere. The subjects of interest to this symposium include, but are not limited to:

- laboratory measurements of reactive/non-reactive uptake
- remote sensing (LIDAR) of polar and/or background aerosols (PSCs, sulfuric acid aerosols, and cirrus clouds)
- atmospheric measurements of surface area, volume, composition, etc.
- modelling studies dealing with the impact of heterogeneous processes.

**OA29/  
ST24 The role of vegetation emissions in tropo-  
spheric chemistry**

Convener: **Dr. Bruno Versino**, Environment Institute, Joint Research Centre, 21020 Ispra (VA), Italy; Tel: +39-332-789958, Fax: +39-332-785704, E-mail: BRUNO.VERSINO@JRC.IT  
Co-Convener: **Prof. Nickolas Hewitt**, Institute of Environmental and Biological Sciences, University of Lancaster, Lancaster LA1 4YQ, United Kingdom; Tel: +44-1524-593931, Fax: +44-1524-593985, E-mail: n.hewitt@lancaster.ac.uk

Biogenic volatile organic compounds (BioVOC) emissions contribute, with the anthropogenic ones, to the chemical and photochemical reactions occurring in the troposphere, hence, to the formation of oxidants, acidic compounds, tropospheric ozone, etc.

For sound abatement policies BioVOC sources should be known and their relative contribution to the "quality" of the troposphere assessed.

**OA30/  
ST15 Changes of UV-B radiation in the atmosphere**

Convener: **Dr. Bernd C. Krüger**, DGR/LPAS, Ecole Polytechnique Federal de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5701, Fax: +41-21-693-3626, E-mail: BERND.KRUEGER@DGR.EPFL.CH  
Co-Convener: **Dr. Ernst-Peter Röth**, Institut f. Physikalische und Theoretische Chemie, Universität Essen, Universitätsstr. 5-7, 45141 Essen, Germany; Tel: +49-201-183-3055, Fax: +49-201-183-3228, E-mail: e.p.roeth@kfa-juelich.de

The observed decline of stratospheric ozone at middle and high latitudes during the last decades leads to an enhanced flux of solar UV-B radiation into the troposphere. The scope of the session covers research in this field concerning the troposphere as well as the stratosphere such as:

- modelling of radiation transfer in the atmosphere;
- observations of UV-B radiation, including the detection of changes;
- effects of increased UV-B radiation, as for example changes in tropospheric chemistry due to an increased radical production and a change of the lifetimes of atmospheric constituents.

**OA31/  
ST1**

**Review session on solar terrestrial sciences**

Convener: **Prof. Dr. Peter Fabian**, Lehrstuhl f. Bioklimatologie und Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weihenstephan, Germany; Tel: +49-8161-714-740, Fax: +49-8161-714-753, E-mail: fabian@met.forst.uni-muenchen.de

This half-day session will deal with highlights of Solar Terrestrial Sciences. Reviews of the middle atmosphere, ionosphere, magnetosphere and their relation to the Sun will be given. Solicited papers only.

**OA32/  
NP1.3**

**Scaling, fractals and nonlinearity in oceans and atmosphere**

Convener: **Dr. Francois Schmitt**, LMD, boîte 99, Université Paris VI, 4, place Jussieu, 75230 Paris Cedex 05, France; Tel: +33-1-44274963, Fax: +33-1-44276272, E-mail: SCHMITT@LMD.JUSSIEU.FR after 1 October 1996 Institut Royal Meteorologique de Belgique, Section Climatologie Dynamique, Avenue Circulaire 3, 1180 Brussels, Belgium; Fax: +32-2-375-12-59, E-mail: schmitt@mocka.ccr.jussieu.fr  
Co-Conveners: **Dr. Robert F. Cahalan**, Laboratory for Atmospheres, NASA - Goddard Space Flight Center, Greenbelt, MD 20771, USA; Tel: +1-301-286-4276, Fax: +1-301-286-1627, E-mail: CAHALAN@CLOUDS.GSFC.NASA.GOV  
**Dr. Gregory Falkovich**, Dept. of Physics, Weizmann Institute of Science, 76100 Rehovot, Israel; Tel: +972-8-934-2830, Fax: +972-8-934-4109, E-mail: fnfal@wicc.weizmann.ac.il  
**Prof. Vladimir V. Yanovsky**, Lab. for Turbulence Research, Institute for Single Crystals, Lenin ave. 60, 310108 Kharkov, Ukraine; Fax: +380-572-320-273, E-mail: KFTI@ROCKET.KHARKOV.UA

This session will highlight nonlinear aspects of ocean and atmosphere turbulence and climate dynamics, manifested through scaling and multifractal properties of observed fields. Theoretical and experimental (including remote sensing) studies of turbulence, seasonal, interannual and climate-scale variations and coupling across a broad range of scales are of primary interest. Related problems include scaling and multifractal analysis and modelling of passive and active scalars, clouds, radiative transfer and radiation interactions with atmosphere and surface, nonlinear waves, global change problems, ozone depletion, diffusion & transport in the ocean & atmosphere.

**OA33/  
NP2.1**

**Predictability**

Convener: **Dr. Myles R. Allen**, Space Science Dept., Rutherford Appleton Laboratory, Chilton Didcot, Oxfordsh. OX11 0QX, United Kingdom; Tel: +44-1235-446428, Fax: +44-1235-445848, E-mail: m.allen1@physics.oxford.ac.uk  
Co-Convener: **Dr. Michael K. Davey**, Hadley Centre for Climate Prediction, Meteorological Office, London Road, Bracknell, Berkshire RG12 2SZ, United Kingdom; Tel: +44-1344-854648, Fax: +44-1344-854898, E-mail: MKDAVEY@METO.GOV.UK

Our ability to predict the evolution of a geophysical system is limited by ignorance of the system's dynamics and trajectory; chaotic behaviour; stochastic forcing; unknown external forcing or some combination of these. Useful forecasts depend on some objective measure of uncertainty. We invite papers relating to quantifying and interpreting predictability in the analysis of non-linear systems and climate forecasting. We encourage papers focussing on climate prediction on seasonal to interannual timescales, including: efficient use ensembles; quantifying trajectory uncertainty with limited data; various measures of prediction "skill"; and using predictability as a diagnostic tool. Papers investigating interactions and possible feedbacks between different sources of uncertainty (e.g. chaos and stochastic forcing; incorrect model physics and unknown external forcing) are particularly welcome.

**OA34/  
NP3.1**

**Dynamics and transport of active and passive tracers**

Convener: **Dr. Bach Lien Hua**, Lab. Physique des Océans, IFREMER, B.P. 70, 29280 Plouzané, France; Fax: +33-98224496, E-mail: LIEN@IFREMER.FR; after 18 October 1996 Fax: +33-2-98224496

Co-Convener: **Dr. Rubén Alberto Pasmanter**, KNMI - Royal Netherlands Meteorological Institute, Postbus 201, 3730 AE De Bilt, The Netherlands; Tel: +31-30-220-6754, Fax: +31-30-221-0247, E-mail: PASMANTE@KNMI.NL

This session will be devoted to fundamental aspects as well as geophysical applications of the transport of tracers by laminar or turbulent flows.

The scope of the session is wide, a variety of topics will be included: advection of passive and active tracers, chemically reacting tracers, dispersion characteristics, quantification of mixedness, advection by vortex structures, etc. Theoretical, numerical, experimental and observational studies are welcomed.

**OA35/  
NP4.1**

**Nonlinear waves, instabilities and wave flow interactions**

Convener: **Dr. Victor I. Shrira**, Shirshov Institute of Oceanology, Russian Academy of Sciences, Krasikova 23, 117218 Moscow, Russia; Tel: +7-095-124-7565, Fax: +7-095-124-5983, E-mail: SHRIRA@GLAS.APC.ORG and VICTOR@CASTOR.UNIV-MRS.FR

Co-Conveners: **Prof. Dr. Lev A. Ostrovsky**, ETL/ERL, NOAA, 325 Broadway, Boulder, CO 80303, USA; Tel: +1-303-497-6138, Fax: +1-303-497-3577, E-mail: LOSTROVSKY@ETL.NOAA.GOV

**Prof. Dr. Manuel G. Velarde**, Instituto Pluridisciplinar, Universidad Complutense de Madrid, Paseo Juan XXIII, No. 1, 28040 Madrid, Spain; Tel: +34-1-394-3242, Fax: +34-1-394-3243, E-mail: mvelarde@eucmvx.sim.ucm.es

The main aims of the session are to discuss the universal mathematical models on which the description of a variety of nonlinear geophysical phenomena can be based, and to investigate specific physical mechanisms of these phenomena. We are mainly interested in works on geophysical fluid dynamics dealing with nonlinear wave processes and wave-related instabilities. This area includes nonlinear dynamics of surface water waves with and without wind, internal waves, wave-turbulence interactions, solitons, wave generation by currents in ocean and atmosphere, nonlinear stages of flow instabilities, critical layers, nonlinear wave, etc.

Theoretical, numerical, experimental and observational works are welcomed.

**VII. Solar-Terrestrial Sciences (ST)**

**ST1/  
OA31**

**Review session on solar terrestrial sciences**

Convener: **Prof. Dr. Peter Fabian**, Lehrstuhl f. Bioklimatologie und Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weißenstephan, Germany; Tel: +49-8161-714-740, Fax: +49-8161-714-753, E-mail: fabian@met.forst.uni-muenchen.de

This half-day session will deal with highlights of Solar Terrestrial Sciences. Reviews of the middle atmosphere, ionosphere, magnetosphere and their relation to the Sun will be given. Solicited papers only.

**ST2/  
OA25**

**Open session on the middle atmosphere**

Convener: **Dr. Martin Dameris**, Institut f. Physik der Atmosphäre, DLR Oberpfaffenhofen, Postfach 11 16, 82230 Wessling, Germany; Tel: +49-8153-28-1558, Fax: +49-8153-28-1841, E-mail: MARTIN.DAMERIS@DLR.DE  
Co-Convener: **Dr. Bernd C. Krüger**, DGR/LPAS, Ecole Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5701, Fax: +41-21-693-3626, E-mail: BERND.KRUEGER@DGR.EPFL.CH

This session will include contributions on all aspects of radiative, chemical, and dynamical processes and their interaction governing the behaviour of the Earth Middle Atmosphere. Topics to be considered include experimental, theoretical, and numerical studies dealing with large or local scale dynamics, vertical and horizontal transfer, homogeneous and heterogeneous chemistry. Since there will be no special session on Stratospheric-Tropospheric Exchange and on the Impact of Aircraft Emissions on the Atmosphere, such papers will also be considered in this open session.

**ST3**

**Open session on the ionosphere and thermosphere**

Convener: **Dr. Dominique Fontaine**, CETP, CNRS, 10-12 av de l'Europe, 78140 Velizy, France; Tel: +33-1-39254917, Fax: +33-1-3925-4922, E-mail: FONTAINE@CETP.IPSL.FR

This session is suitable for contributions on all aspects of the ionospheric or thermospheric physics, including experimental and modelling studies, and concerning as well transient events as large-scale structures and dynamics. Special interest will be devoted to results from the recent networks of ground-based instruments (ESR, SuperDARN, ...) and to studies of coordination with low-altitude polar satellites.

#### ST4 **Open session on the magnetosphere**

Convener: **Prof. Michael J. Rycroft**, International Space University, Parc d'Innovation, Boul. Gonthier d'Andernach, 67400 Illkirch, France; Tel: +33-88655438, Fax: +33-88655435, E-mail: RYCROFT@ISU.ISUNET.EDU; *after 18 October 1996* Tel: +33-3-88655438, Fax: +33-3-88655435

The purpose of the session is to provide a forum for papers on magnetospheric physics which do not fit within the other, more specialized sessions.

#### ST5 **Open session on solar and heliospheric physics (incl. Soho)**

Convener: **Dr. Richard G. Marsden**, Space Science Department, Solar System Division, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71- 565-3583, Fax: +31-71-565-4697, E-mail: RMARSDEN@ESTEC.ESA.NL

Co-Convener: **Dr. Bernard H. Foing**, Department of Space Science, Solar System Division, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-5647, Fax: +31-71-565-4697, E-mail: BFOING@ESTEC.ESA.NL

The session provides a forum for the discussion and presentation of all aspects of solar and heliospheric physics. Central to the 1997 session will clearly be results from SOHO. Contributions dealing with findings from other on-going solar and heliospheric space missions, such as Ulysses, Wind and Yohkoh, are also solicited, as are papers from ground based observers and the theoretical community. The session will include oral and poster presentations.

#### ST6 **Solar mass ejections**

Convener: **Dr. Volker Bothmer**, Institut für Reine und Angewandte Kernphysik der Universität, Olshausenstraße 40, 24118 Kiel, Germany; Tel: +49-431-880-2508, Fax: +49-431-85660, E-mail: bothmer@ifk.ki.kernphysik.uni-kiel.de  
Co-Convener: **Dr. Bernard H. Foing**, Dept. of Space Science, Solar System Div., European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-5647, Fax: +31-71-565-4697, E-mail: BFOING@ESTEC.ESA.NL

Solar mass ejections (SMEs) have first been discovered with space-borne coronagraphs about 20 years ago. It was soon recognized that SMEs should bridge the missed link between solar activity phenomena and transient interplanetary and geomagnetic disturbances, which had so far been predominantly attributed almost solely to solar flares. Subsequent research on SMEs confirmed that SMEs are prime causes of heliospheric disturbances and major geomagnetic storms and that they play an important role in the restructuring of the Sun's coronal magnetic field. However, we do not understand properly their origin and development and the evolution of the underlying coronal magnetic field nor do we know their 3-D structure and evolution into the heliosphere. New instruments onboard SOHO provide us now with unprecedented views of SMEs and with accurate measurements of associated activity phenomena from below the Sun's surface up to the upper atmosphere further out into interplanetary space. The aim of this session is to review our current understanding about SMEs, to present new results on SMEs obtained e.g. by SOHO, including correlations with other spacecraft observations (e.g. Yohkoh, Ulysses, Wind), and to address aspects of future research.

#### Topics:

- SOHO observations: A new perspective of SMEs
- Origin (including e.g. onset conditions, role of reconnection processes, etc.), structure and evolution of SMEs
- Signatures of SMEs beyond white light observations
- Relationship of SMEs with other forms of solar and interplanetary activity (e.g. coronal shocks, X-rays, filaments, energetic particles)
- Identification and characteristics of SMEs in interplanetary space
- Interplanetary consequences of SMEs and space weather

The symposium will include solicited and contributed oral presentations as well as poster papers.

#### ST7

#### **Solar and heliospheric physics beyond 2000**

Convener: **Dr. Bernard H. Foing**, Dept. of Space Science, Solar System Division, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-5647, Fax: +31-71-565-4697, E-mail: BFOING@ESTEC.ESA.NL  
Co-Convener: **Dr. Richard G. Marsden**, Space Science Department, Solar System Division, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-3583, Fax: +31-71-565-4697, E-mail: RMARSDEN@ESTEC.ESA.NL

ST8/  
NP1.4

**Nonlinear dynamics in the heliosphere: shocks, solitons and fractals**

Convener: **Dr. Wieslaw M. Macek**, Space Research Centre, Polish Academy of Sciences, Bartycka 18 A, 00716 Warsaw, Poland; Tel: +48-22-403766, Fax: +48-39-121-273, E-mail: MACEK@CBK.WAW.PL

Co-Convener: **Prof. Dr. Eckart Marsch**, Max-Planck-Institut für Aeronomie, Max-Planck-Str. 2, 37191 Katlenburg-Lindau, Germany; Tel: +49-5556-979-292, Fax: +49-5556-979-240, E-mail: MARSCH@LINAX1.MPAE.GWDG.DE

The main aim of this session is to discuss nonlinear phenomena in the heliosphere. Typical examples are: various collisionless shocks, including planetary, cometary and interplanetary shocks and the heliospheric termination shock, and the related large-amplitude and solitary plasma waves. As fractal analysis of the solar wind flow is of great interest, the results of research on scaling and fractal properties of the solar wind fluctuations will be considered. The application of time-series analysis and structure functions, which are new nonlinear methods for data analysis, is especially relevant for studying the question of whether the irregular behaviour of the solar wind flow results from intrinsic nonlinear dynamics or external random forces. Both theoretical and experimental contributions are solicited.

ST9

**New approaches to studies of wave-particle interactions in the magnetosphere**

Convener: **Prof. Michael J. Rycroft**, International Space University, Parc d'Innovation, Boul. Gonthier d'Andernach, 67400 Illkirch, France; Tel: +33-88655438, Fax: +33-88655435, E-mail: RYCROFT@ISU.ISUNET.EDU; *after 18 October 1996* Tel: +33-3-88655438, Fax: +33-3-88655435

Co-Conveners: **Dr. Lars Eliasson**, Swedish Institute of Space Physics, P.O. Box 812, 981 28 Kiruna, Sweden; Tel: +46-980-79087, Fax: +46-980-79050, E-mail: LARS@IRF.SE

**Dr. Richard Horne**, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, United Kingdom; Tel: +44-1223-251542, Fax: +44-1223-362616, E-mail: R.HORNE@BAS.AC.UK

**Prof. Victor Yu. Trakhtengerts**, Magnetosphere and Ionosphere Physics Lab., Applied Physics Institute, Russian Academy of Science, 46, Ulyanov st., 603600 Nizhny Novgorod, Russia; Tel: +7-8312-364279, Fax: +7-8312-362061, E-mail: VYT@APPL.SCI-NNOV.RU

New theoretical treatments are giving now insights into detailed physics of the interactions between energetic electrons and whistler mode waves in the magnetosphere. Further, computer simulations of such wave-particle interactions are being developed. The interrelationships between these results and experimental observations are expected to lead to new results. Papers discussing any of these aspects, and related studies are welcomed.

ST10

**High-latitude magnetosphere: new results from recent projects**

Convener: **Dr. Masatoshi Yamauchi**, Swedish Institute of Space Physics, P.O. Box 812, 981 28 Kiruna, Sweden; Tel: +46-980-79120, Fax: +46-980-79050, E-mail: YAMAU@IRF.SE

Although the first attempt of CLUSTER failed, there are many new high-latitude magnetospheric/ionospheric projects which successfully deliver data. This symposium will provide an opportunity of deep scientific discussions by gathering "hot results" of the new high-latitude missions. Papers from the Interball, Polar, and Fast satellites, SuperDarn related radars, and the EISCAT Svalbard radar are especially encouraged.

ST11

**The polar ionosphere and magnetosphere**

Convener: **Dr. Jean-Paul Villain**, LPCE, CNRS, 3 A avenue de la Recherche Scientifique, 45071 Orleans Cedex 2, France; Tel: +33-38515287, Fax: +33-38631234, E-mail: JVILLAIN@CNRS-ORLEANS.FR; *after 18 October 1996* Tel: +33-2-38515287, Fax: +33-2-38631234

Co-Convener: **Dr. Joachim Woch**, Max-Planck-Institut für Aeronomie, Max-Planck-Str. 2, 37191 Katlenburg-Lindau, Germany; Tel: +49-5556-979-447, Fax: +49-5556-979-240, E-mail: WOCH@LINAX1.MPAE.GWDG.DE

The aim of this session is to look into the electrodynamic coupling between the polar ionosphere and magnetosphere. Coordinated studies between the Auroral and Tail Probes of the Interball project and Ground Based Observations are particularly welcome.

ST12

**Mesospheric clouds: the morphology and physics of ice in the 80-100 km height region**

Convener: **Dr. Michael Gadsden**, 12 Keir Street, Perth PH2 7 HJ, United Kingdom; Tel: +44-1738-440-358, Fax: +44-1738-440-358

Co-Convener: **Dr. Aodhagan F. Roddy**, Martin Ryan Marine Science Institute, University College, Galway, Ireland; Tel: +353-91-750-441, Fax: +353-91-525-005

Accounting for the presence of clouds in the upper mesosphere presents some problems: the nucleation of the cloud particles can take place by homogeneous nucleation at very low temperatures, or on an ion, or on meteoric dust. The cloud particle grows through aggregation of water molecules, or by adherence to other cloud particles. While growing, the cloud particle falls into progressively warmer levels until it eventually falls to where the air is no longer saturated. During the period of growth, winds may move the particle many hundreds of kilometres from the place at which it was nucleated. All aspects of this growth will be discussed and an attempt made to reconcile the models with the observations of mesospheric clouds and of noctilucent clouds.



**ST13 Ionosphere-thermosphere-mesosphere coupling**  
 Convener: **Dr. Martin J. Jarvis**, British Antarctic Survey, High Cross, Madingley Road, Cambridge CB3 0ET, United Kingdom; Tel: +44-1223-251-548, Fax: +44-1223-362-616, E-mail: M.JARVIS@BAS.AC.UK  
 Co-Convener: **Dr. Alan D. Aylward**, Atmospheric Physics Laboratory, Dept. of Physics and Astronomy, University College London, Riding House Street 67-73, London W1P 7PP, United Kingdom; Tel: +44-1716368333 ext. 3035, Fax: +44-171-380-7161, E-mail: ALAN@APG.PH.UCL.AC.UK

This symposium will focus on dynamical coupling between the neutral and ionized atmosphere and between the mesosphere and thermosphere. Its aim will be to further understand energy transfer and dissipation within the ionosphere-thermosphere-mesosphere (ITM) region. Contribution will be particularly welcomed in the following areas:

- wave generation and modification in the neutral atmosphere through electrodynamic processes
- variations in thermospheric winds and waves coupled to mesospheric temperature and dynamics
- mesosphere and lower thermosphere "weather" induced through ionized energy dissipation
- vertical coupling through the ITM region
- O<sup>+</sup>-O collision frequency.

**ST14/ OA27 Global ozone**  
 Convener: **Dr. Michaela-Maria Hirschberg**, Lehrstuhl f. Bioklimatologie & Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weihenstephan, Germany; Tel: +49-8161-714-742, Fax: +49-8161-714-753, E-mail: mmh@atmos1.met.forst.uni-muenchen.de  
 Co-Conveners: **Prof. Dr. Peter Fabian**, Lehrstuhl f. Bioklimatologie und Immissionsforschung, Universität München, Hohenbachernstr. 22, 85354 Freising-Weihenstephan, Germany; Tel: +49-8161-714-740, Fax: +49-8161-714-753, E-mail: fabian@met.forst.uni-muenchen.de  
**Dr. Alexei A. Krivolutsky**, Central Aerological Observatory, 3 Pervomayskaya str., 141700 Dolgoprudny, Moscow Region, Russia; Tel: +7-095-576-3327, Fax: +7-095-57-63-327, E-mail: VVCAO@SOVAM.COM

The session will deal with ozone and its distribution in the atmosphere, as well as trace constituents related to ozone photochemistry. Main emphasis will be on the middle atmosphere, but papers on tropospheric ozone related to global aspects will also be considered for presentation.

Contributions dealing with field measurements, laboratory investigations and modelling are invited.

Special attention will be given to papers dealing with ozone losses and trends due to heterogeneous reactions on sulfate aerosols and PSCs at

northern latitudes, and their impact on the UV radiation field. We also wish to focus on solar radiation and particle effects on the ozone layer.

**ST15/ OA30 Changes of UV-B radiation in the atmosphere**  
 Convener: **Dr. Bernd C. Krüger**, DGR/LPAS, Ecole Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5701, Fax: +41-21-693-3626, E-mail: BERND.KRUEGER@DGR.EPFL.CH  
 Co-Convener: **Dr. Ernst-Peter Röth**, Institut f. Physikalische und Theoretische Chemie, Universität Essen, Universitätsstr. 5-7, 45141 Essen, Germany; Tel: +49-201-183-3055, Fax: +49-201-183-3228, E-mail: e.p.roeth@kfa-juelich.de

The observed decline of stratospheric ozone at middle and high latitudes during the last decades leads to an enhanced flux of solar UV-B radiation into the troposphere. The scope of the session covers research in this field concerning the troposphere as well as the stratosphere such as:

- modelling of radiation transfer in the atmosphere;
- observations of UV-B radiation, including the detection of changes;
- effects of increased UV-B radiation, as for example changes in tropospheric chemistry due to an increased radical production and a change of the lifetimes of atmospheric constituents.

**ST16/ OA24 Solar cycles and global climate variability**  
 Convener: **Prof. Giuliana Cini-Castagnoli**, Dipartimento di Fisica Generale, Università di Torino, Via P. Giuria 1, 10125 Torino, Italy; Tel: +39-11-6604066, Fax: +39-11-6604056, E-mail: CINI@ICG.TO.INFN.IT  
 Co-Convener: **Dr. Jean-Claude Duplessy**, Centre des Faibles Radioactivités, CNRS - CEA, Avenue de la Terrasse, 91198 Gif-sur-Yvette Cedex, France; Tel: +33-1-69823526, Fax: +33-1-69823568, E-mail: jean-claude.duplessy@cfr.cnrs-gif.fr

**ST17 Pioneers in solar-terrestrial physics during the 19th and 20th centuries**  
 Conveners: **Wilfried Schröder**, Geophysical Station, Hechelstr. 8, 28777 Bremen-Rönnebeck, Germany  
**Prof. Jozsef Verö**, Geodetic and Geophysical Research Institute, P.O. Box 5, 9401 Sopron, Hungary; Fax: +36-99-313-267, E-mail: VERO@GKKI.HU

The results of various historical and scientific studies concerning the development of solar-terrestrial physics and related disciplines (astronomy, physics) will be discussed. Main topics are scientific biographies and research programmes in this field and progress in running research during the past 200 years (observations, theory, experiments).



**ST18/ Open session on turbulent boundary layers**

**OA12 01 Basic turbulent studies**

Convener: **Dr. Arakel Petrosyan**, Space Research Institute, Profsoyuznaya Ulitsa 84/32, 117810 Moscow, Russia; Tel: +7-095-333-3011, Fax: +7-095-310-7023, E-mail: APETROSY@ESOC1.BITNET

Co-Convener: **Dr. Thomas Gerz**, Institut f. Physik der Atmosphäre, DLR Oberpfaffenhofen, Postfach 11 16, 82230 Wessling, Germany; Tel: +49-8153-28-1333, Fax: +49-8153-28-1841, E-mail: thomas.gerz@dlr.de

Main goal of this symposium is to characterize turbulence and the mixing and stirring properties of geophysical flow regimes at various scales in the oceans and in the atmosphere. Interaction of small-scale turbulence with non-turbulent motions like waves and currents will be discussed. Importance will be attached to the problem of proper, scale-dependent parameterization of turbulence and mixing processes for flow dynamics at larger scales (boundary-layer flows, interfacial flows, free flows, global-scale dynamics). Modelling, theoretical and observational papers on these topics of geophysical turbulence will be encouraged.

**02 Studies of atmospheric surface fluxes (Co-sponsored by BAHC)**

Convener: **Dr. Thomas Foken**, Meteorologisches Observatorium Lindenberg, Deutscher Wetterdienst, Schulstr., 15864 Lindenberg, Germany; Tel: +49-33677-60-228, Fax: +49-33677-60-280, E-mail: FOKEN@MOL.DWD.D400.DE

Co-Convener: **Dr. Riccardo Valentini**, Dept. of Forest Science and Environment, Università di Tuscia, Via S Camillo de Lellis, 01100 Viterbo, Italy; Tel: +39-761-357394, Fax: +39-761-357389, E-mail: RIK@UNITUS.IT

Measurement and parametrization of turbulent fluxes of momentum, sensible and latent heat and gaseous compounds are the topics of the session. It is mainly addressed on fundamental and methodical problems. These are new measuring methods, correction and quality control procedures, flux parameterizations and so on. Also the comparison of experimental data and model outputs will be discussed as well as problems of measurements over different surfaces and the determination of area averaged fluxes.

**03 Atmospheric boundary layer studies**

Convener: **Dr. Jorgen Hojstrup**, Dept. of Meteorology and Wind Energy, Meteorological Division, Risø Forskningscenter, P.O. Box 49, 4000 Roskilde, Denmark; Tel: +45-4677-5020, Fax: +45-4675-5619, E-mail: JORGEN.HOJSTRUP@RISOE.DK

Co-Conveners: **Dr. Ulrich Corsmeier**, Institut f. Meteorologie & Klimaforschung, Forschungszentrum Karlsruhe, Postfach 36 40, 76021 Karlsruhe, Germany; Tel: +49-7247-822-843, Fax: +49-7247-824-742, E-mail: ulrich.corsmeier@imk.fzk.de

**Dr. Petra Seibert**, Institut f. Meteorologie und Physik, Universität Wien, Türkenschanzstr. 18, 1180 Wien, Austria; Tel: +43-1-36026-2410, Fax: +43-1-36025-74, E-mail: SEIBERT@ZAMG.AC.AT

Papers are invited which focus on the development of turbulent atmospheric boundary layer in general. Processes and phenomena which are of fundamental importance for the diurnal cycle of the boundary layer height and its internal structure over homogeneous as well as nonhomogeneous terrain should be presented. Examples of the space scales under consideration reach from the investigation of single hill-valley systems to the aggregated influence of large and very complex landscape structures. The role of the surface energy balance in the boundary layer development on the one hand and the processes affecting the transition zone between the boundary layer and the free atmosphere, like entrainment, and mountain-, cloud- and advective-venting on the other hand should be discussed. Results from experimental, model and theoretical investigations are requested.

**ST19/ Open session on mesoscale studies**

**OA11 01 Mesoscale meteorology**

Convener: **Dr. Gerhard Adrian**, Institut f. Meteorologie & Klimaforschung, Forschungszentrum Karlsruhe, Postfach 36 40, 76021 Karlsruhe, Germany; Tel: +49-7247-82-2844, Fax: +49-7247-82-4742, E-mail: ADRIAN@IMKHP3.FZK.DE and ADIRAN@IMK.FZK.DE

Co-Convener: **Dr. Yvon Lemaitre**, CNET/CRPE, 38-40, rue General Leclerc, 92141 Issy-les-Moulineaux, France; Tel: +33-1-39253916, Fax: +33-1-39254778, E-mail: LEMAITRE@CETP.IPSL.FR

The objective of this session is to discuss mesoscale processes and phenomena. Developments of analysis tools are also included like observations and modelling. Papers presenting results from past field experiments and plans for future experimental work are invited.

The main emphasis is on fundamental dynamics of mesoscale processes like orographic flow, thermally induced circulations mid latitude and tropical cyclones or deep convection. Papers on tools and developments of numerical weather prediction should be submitted to the Numerical Weather prediction session.

## 02 Mesoscale transport of pollutants

Convener: **Prof. Dr. Eberhard H. Schaller**, Lehrstuhl für Umweltmeteorologie, Brandenburgische Technische Universität, Postfach 10 13 44, 03013 Cottbus, Germany; Tel: +49-355-7813-186, Fax: +49-355-7813-132, E-mail: schaller@umwelt.tu-cottbus.de

Co-Convener: **Dr. Torben Mikkelsen**, Department of Meteorology and Wind Energy, Meteorological Division, Risø Forskningscenter, P.O. Box 49, 4000 Roskilde, Denmark; Tel: +45-46-775009, Fax: +45-46-755619, E-mail: met-tomi@risoe.dk

ST20/  
OA20

## Storm track and cyclone variability

Convener: **Dr. Uwe Ulbrich**, Institut für Geophysik und Meteorologie, Kerpener Str. 13, 50923 Köln, Germany; Tel: +49-221-470-3688, Fax: +49-221-470-5161, E-mail: ULBRICH@METEO.UNI-KOELN.DE

Co-Convener: **Dr. Paul J. Valdes**, Dept. of Meteorology, University of Reading, 2 Earley Gate, Whiteknights, Reading, Berks. RG6 2AU, United Kingdom; Tel: +44-1734-316517, Fax: +44-1734-352604, E-mail: P.J.VALDES@READING.AC.UK

This session will assess the variability in the intensities and positions of the mid-latitude storm tracks and of the related paths and development of extratropical cyclones. Papers studying statistical approaches and investigations on the controlling mechanisms are sought. Observational results, GCM studies for the present, past and future climates are welcome. Presentations on the growth of disturbances in an idealized environment are also encouraged.

ST21/  
OA9

## Biogenic air-sea fluxes and processes in coastal and marginal seas

Convener: **Dr. Patrick Buat-Menard**, Dept. de Géologie et Oceanographie, Université de Bordeaux I, Avenue des Facultés, 33405 Talence Cedex, France; Tel: +33-5684-8870, Fax: +33-5684-0848, E-mail: BUAT@GEOCEAN.U-BORDEAUX.FR; after 18 October 1996 Tel: +33-5-5684-8870, Fax: +33-5-5684-0848

Co-Convener: **Prof. Nicholas J.P. Owens**, Dept. of Marine Sciences and Coastal Management, University of Newcastle upon Tyne, Ridley Building, Newcastle-upon-Tyne NE1 7RU, United Kingdom; Tel: +44-191-222-8885, Fax: +44-191-222-7891, E-mail: N.OWENS@NEWCASTLE.AC.UK

Coastal zones are active sources and sinks of carbon dioxide and several biologically reactive gases (for example: nitrous oxide, methane, halo-carbons, sulfur compounds etc.). These gases are of significance in both a biogeochemical sense (e.g. sulphur gases produced in the coastal zone may be a significant source of sulphur for the terrestrial environment) and in influencing the composition of the atmosphere (e.g. nitrous oxide and methane are greenhouse gases). There are indications that the fluxes of many of these gases in the coastal zone

are of sufficient magnitude to be of global significance. Thus, an understanding of the role of the coastal zone as sources or sinks of biogases (and possible feedbacks) is essential in the context of global change. The aim of this workshop is to bring together all the issues of relevance to this subject in the context of ongoing national and international research efforts.

The workshop will focus on:

- identification of the gases of importance in the coastal zone and their inventories in a global context,
- biological sources and sinks in the coastal zone and possible feedbacks,
- physical controls on source and sinks and transfer mechanisms between the aquatic and terrestrial ecosystems and the atmosphere,
- future research needs.

ST22/  
OA10

## Sulphur cycle in the marine atmosphere

Convener: **Karsten Suhre**, Lab. d'Aérolologie, UMR CNRS/UPS 5560, Observatoire Midi-Pyrénées, 14, Ave. E. Belin, 31400 Toulouse, France; Tel: +33-61332754, Fax: +33-61332790, E-mail: SUHK@AERO.OBS-MIP.FR; after 18 October 1996 Tel: +33-5-61332754, Fax: +33-5-61332790

Co-Convener: **Dr. Harald Berresheim**, Deutscher Wetterdienst, Albin-Schwaiger-Weg 10, 82383 Hohenpeissenberg, Germany; Tel: +49-8805-9200-44, Fax: +49-8805-9200-46, E-mail: HARALD@MOHP.DWD.D400.DE

The role of sulphate aerosol particles in radiative forcing, particularly in the marine atmosphere, presents a major uncertainty in present climate models. This calls for a better understanding of the budget and the chemical and physical processing of sulphur in the marine atmosphere. The scope of this session should include and up-to-date overview of relevant processes in the marine environment such as DMS emission, DMS oxidation, sulphate particle formation and growth, cloud cycling, dry and wet deposition, and transport processes. Presentations of laboratory and field measurements including remote sensing as well as of model simulations are solicited.

ST23/  
OA28

## Heterogeneous processes of ozone destruction in the stratosphere and troposphere

Convener: **Dr. Andreas Wahner**, Institut f. Atmosphärische Chemie, ICG-3, Kernforschungszentrum Jülich, Postfach 1913, 52425 Jülich, Germany; Tel: +49-2461-61-5932, Fax: +49-2461-61-5346, E-mail: a.wahner@kfa-juelich.de

Co-Convener: **Dr. Michel J. Rossi**, LPAS-DGR, Ecole Polytechnique Fédérale de Lausanne, 1015 Lausanne, Switzerland; Tel: +41-21-693-5321, Fax: +41-21-693-3626, E-mail: MICHEL.ROSSI@DGR.EPFL.CH

The aim of this symposium is to discuss recent improvements in our understanding of heterogeneous processes relevant to atmospheric chemistry: Heterogeneous reactions in the atmosphere have been now recognized to play critical roles

in many environmental issues (for example: polar stratospheric ozone depletion, chemistry in clouds/ on aerosols in the upper and lower troposphere, chemistry in the wake of aircrafts). This symposium will cover heterogeneous chemistry of the stratosphere and troposphere. The subjects of interest to this symposium include, but are not limited to:

- laboratory measurements of reactive/non-reactive uptake
- remote sensing (LIDAR) of polar and/or background aerosols (PSCs, sulfuric acid aerosols, and cirrus clouds)
- atmospheric measurements of surface area, volume, composition, etc.
- modelling studies dealing with the impact of heterogeneous processes.

#### ST24/ OA29 **The role of vegetation emissions in tropospheric chemistry**

Convener: **Dr. Bruno Versino**, Environment Institute, Joint Research Centre, 21020 Ispra (VA), Italy; Tel: +39-332-789958, Fax: +39-332-785704, E-mail: BRUNO.VERSINO@JRC.IT  
Co-Convener: **Prof. Nickolas Hewitt**, Institute of Environmental and Biological Sciences, University of Lancaster, Lancaster LA1 4YQ, United Kingdom; Tel: +44-1524-593931, Fax: +44-1524-593985, E-mail: n.hewitt@lancaster.ac.uk

Bio-genic volatile organic compounds (BioVOC) emissions contribute, with the anthropogenic ones, to the chemical and photochemical reactions occurring in the troposphere, hence, to the formation of oxidants, acidic compounds, tropospheric ozone, etc.

For sound abatement policies BioVOC sources should be known and their relative contribution to the "quality" of the troposphere assessed.

### VIII. Planetary and Solar System Sciences (PS)

#### PS1 **Planetary interiors**

Convener: **Dr. Philippe Lognonné**, Dept. of Seismology, Institut de Physique du Globe, 4 Place Jussieu, 75252 Paris Cedex 05, France; Tel: +33-1-44272471, Fax: +33-1-44273894, E-mail: LOGNONNE@IPGP.JUSSIEU.FR  
Co-Convener: **Dr. Tamara V. Gudkova**, Institute of Physics of the Earth, B. Gruzinskaya 10, 123810 Moscow, Russia; Tel: +7-095-254-5152, Fax: +7-095-254-9088, E-mail: GUDKOVA@PG12.IEPHYS.MSK.RU

The scope of this session is to review progress in our understanding of

- the interior structure of the planets and satellites
- the physical and chemical evolution of the interior of planets, such as, e.g. differentiation, convection and magnetic field generation.

Papers on new lines of research or new methods in planetary data acquisitions either from ground observation, laboratory experiments or space missions are encouraged.

Papers on the experiments and scientific objectives on launched Mars Missions (MGS96, Pathfinder, Mars96) or on future planetary missions are also welcomed, when these experiments address the scope of the session.

#### PS2

#### **Evolution and state of surfaces, crusts and lithospheres of planetary bodies**

##### **01 Venus: the emerging understanding of Earth's sister planet**

Convener: **Dr. R. Stephen Saunders**, Mail Stop 183-335, Earth and Space Sciences Division, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109, USA; Tel: +1-818-354-2867, Fax: +1-818-393-6546, E-mail: saunders@scn1.jpl.nasa.gov  
Co-Convener: **Dr. Jouko Raitala**, Dept. of Geosciences and Astronomy, University of Oulu, P.O. Box 400, Linnanmaa, 90571 Oulu 57, Finland; Tel: +358-81-553-1945, Fax: +358-81-553-1934, E-mail: JOUKO.RAITALA@OULU.FI

Venus data from the Magellan Mission have been under analysis for several years. Geophysicists now have global gravity and topography data for Venus equal in quality to those data sets for the Earth. We have a 120m resolution global radar image map of Venus that is allowing systematic geologic mapping of the planet. The basic understanding of Venus as a planet so different and yet so similar to Earth has matured over this period. The purpose of this symposium is to present a compendium of that evolving understanding of Earth's sister planet.

##### **02 Mars: new efforts of understanding its evolution**

Convener: **Dr. Agustin Chicarro**, Code SO, ESA/ESTEC, Space Science Department, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-3613, Fax: +31-71-565-4697, E-mail: achicarr@estec1.dnet.estec.esa.nl  
Co-Convener: **Prof. Steven W. Squyres**, Space Sciences Bldg., Cornell University, Ithaca, NY 14853, USA; Tel: +1-607-255-3508, Fax: +1-607-255-5970, E-mail: squyres@astrosun.tn.cornell.edu

##### **03 Other planets: new results**

Convener: **Prof. Dr. Peter Janle**, Institut für Geophysik, Universität Kiel, Olshausenstr. 40-60, 24118 Kiel, Germany; Tel: +49-431-880-3902, Fax: +49-431-880-4432, E-mail: GEO23@PHYSIK.UNI-KIEL.D400.DE

Co-Convener: **Dr. Alexander T. Basilevsky**, Vernadsky Institute of Geochemistry and Analytical Chemistry, Kosygin St. 19, 117975 Moscow, Russia; Tel: +7-095-137-4995, Fax: +7-095-938-2054, E-mail: ABASILEVSKY@GLAS.APC.ORG

The scientific field of this session is planned to cover contributions from geology, geophysics, and geochemistry. Interdisciplinary considerations are welcome. It is the aim of this session to investigate surface morphology and geology of planetary bodies and to describe their tectonic evolution. Further, contributions about the state and evolution of crusts and lithospheres are expected. The aspect of comparative planetology including the Earth as a planetary body should be considered. Please, pay attention to the special session PS2.1 and PS2.2.

**PS3 Atmospheres of the terrestrial and outer planets**

Convener: **Dr. Stephen Richard Lewis**, Clarendon Laboratory, Atmospheric, Oceanic & Planetary Physics, Parks Road, Oxford OX1 3PU, United Kingdom; Tel: +44-1865-272086, Fax: +44-1865-272-923, E-mail: S.LEWIS1@PHYSICS.OXFORD.AC.UK

Co-Convener: **Dr. Frederic Hourdin**, Lab. de Meteorologie Dynamique, Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-4432-2247, Fax: +33-1-4336-8392, E-mail: HOURDIN@LMD.ENS.FR

This session is concerned with all aspects of the dynamics, physics and chemistry of the atmospheres of the terrestrial and outer planets. Original contributions from observational, theoretical and modelling studies are welcome. In particular, studies of comparative planetology between the Earth, Mars and Venus are encouraged as is work on dynamical, chemical and radiative processes in the Giant Planets, especially that relevant to the Galileo mission to Jupiter. Papers concerning the atmosphere of Titan are directed to the special session PS4 Titan Surface-Atmosphere Interaction, which will be arranged so that attendance at both sessions is possible.

**PS4 Titan's atmosphere and surface: recent developments**

Convener: **Dr. Athena Coustenis**, DESPA (Bat. 18), Observatoire de Paris - Meudon, 5 Place Jules Janssen, 92195 Meudon Principal Cedex, France; Tel: +33-1-45077720, Fax: +33-1-4507-7469, E-mail: COUSTENIS@OBSPM.FR

Co-Convener: **Prof. Fred W. Taylor**, Department of Atmospheric, Oceanic and Planetary Physics - Clarendon Laboratory - University of Oxford, Park Road, Oxford OX1 3PU, United Kingdom; Tel: +44-1865-272903, Fax: +44-1865-272924, E-mail: F.TAYLOR1@PHYSICS.OXFORD.AC.UK

The aim of this meeting is to synthesize some of the advances reached in Titan since the last Titan Symposium in Toulouse in 1991, in particular those having to do with the atmosphere and the surface of the satellite.

1997 is also of course the launch year of the Cassini mission to Titan and the Saturnian system and the highlights of this mission will be discussed, (PIs are invited to present their instruments).

**PS5 Lunar exploration**

Convener: **Dr. Bernard H. Foing**, Department of Space Science, Solar System Division, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-5647, Fax: +31-71-565-4697, E-mail: bfoing@estec.esa.nl  
Co-Convener: **Dr. Harald Hoffmann**, Institute of Planetary Exploration, DLR - Außenstelle Berlin, Rudower Chaussee 5, 12489 Berlin, Germany; Tel: +49-30-69545-327, Fax: +49-30-69545-303, E-mail: HOFFMANN@TERRA.PE.BA.DLR.DE

**PS6 Planetary magnetospheres and ionospheres**

Convener: **Dr. Renée Prangé**, Bat. 121, Institut d'Astrophysique Spatiale, Université Paris XI, Campus d'Orsay, 91405 Orsay, France; Tel: +33-1-69858582, Fax: +33-1-69858675, E-mail: PRANGE@IASLAB.IAS.FR

Co-Convener: **Dr. Michele K. Dougherty**, Space and Atmospheric Physics, The Blackett Laboratory, Imperial College, Prince Consort Road, London, SW7 2BZ, United Kingdom; Tel: +44-171-594-7757, Fax: +44-171-594-7772, E-mail: M.DOUGHERTY@IC.AC.UK

**Prof. Dr. Konrad Sauer**, Max-Planck-Institut für Extraterrestrische Physik, Außenstelle Berlin, Rudower Chaussee 5, 12489 Berlin, Germany; Tel: +49-30-6392-3938, Fax: +49-30-6392-3939, E-mail: KS@APEX.MPE.FTA-BERLIN.DE

**PS7 Small bodies of the solar system**

Convener: **Dr. Gerhard H. Schwehm**, Space Science Dept. of ESA, European Space Research and Technology Centre, Keplerlaan 1, Postbus 299, 2200 AG Noordwijk, The Netherlands; Tel: +31-71-565-3539, Fax: +31-1719-84697, E-mail: gschwehm@vmprofs.estec.esa.nl

Co-Convener: **Dr. Stephan Ulamec**, Institut f. Raumsimulation, DLR, German Aerospace Research Establishment, Linder Höhe, 51147 Köln, Germany; Tel: +49-2203-601-4567, Fax: +49-2203-61471, E-mail: stephan.ulamec@europa.rs.kp.dlr.de

**PS8 Solar system radiophysics and related topics**

Convener: **Dr. Helmut O. Rucker**, Institut für Weltraumforschung, Österr. Akademie der Wissenschaften, Halbärthgasse 1, 8010 Graz, Austria; Tel: +43-316-380-5258, Fax: +43-316-384-091, E-mail: HELMUT.RUCKER@KFUNIGRAZ.AC.AT

Co-Convener: **Prof. Colin H. Barrow**, Max-Planck-Institut für Aeronomie, Max-Planck-Str. 2, 37191 Katlenburg-Lindau, Germany; Tel: +49-5556-979-156, Fax: +49-5556-979-240, E-mail: BARROW@LINAX2.DNET.GWDG.DE

## PS9

### From laboratory studies to future space experiments

Convener: **Dr. Pascale Ehrenfreund**, Leiden Observatory, P.O. Box 9513, 2300 RA Leiden, The Netherlands; Tel: +31-715-275-812, Fax: +31-715-275-819, E-mail: pascale@strwchem.strw.leidenuniv.nl

Co-Conveners: **Dipl.-Phys. Hermann Kochan**, Institut f. Raumsimulation, DLR, German Aerospace Research Establishment, Linder Höhe, 51147 Köln, Germany; Tel: +49-2203-601-2667, Fax: +49-2203-61768, E-mail: hermann.kochan@europa.rs.kp.dlr.de

**Dr. Catherine Krafft**, Lab. de Physique des Gaz et des Plasmas, Bat. 212, Université Paris Sud, 91405 Orsay, France; Tel: +33-1-6941-7384, Fax: +33-1-6941-7844, E-mail: CATHERINE.KRAFFT@LPGP.U-PSUD.FR

**Prof. Valerio Pirronello**, Istituto di Fisica, Università di Catania, Viale A. Doria 6, 95125 Catania, Italy; Tel: +39-95-256-434, Fax: +39-95-333-231, E-mail: PIRRONELLO@FIS.UNICAL.IT

The meeting will present laboratory studies and simulations related to ground based observations and space experiments on:

- gases, dust, and ices,
- on atmospheres, magnetospheres, and solid surfaces
- on small bodies and planets.

This programme will allow to cover techniques and results from:

1. Investigations of surface near physical and chemical phenomena on small bodies and planets by experiments with simulated material under simulated conditions.
2. Furthermore speakers are invited to present the results of physical and chemical studies on gases, dust, ices, organics and minerals relevant in solar system processes, gained by:
  - polarization measurements & spectroscopy
  - microscopy and materials analysis
  - isotopic analysis
  - gas chromatography/mass spectrometry
  - ion bombardment
  - hypervelocity impacts
3. Laboratory plasma investigations dealing with:
  - Turbulence phenomena in plasmas
  - Antennas and Tethers in plasmas
  - Beam-plasma interaction
  - Stochastic heating & particle acceleration
  - Wave emission, propagation and instabilities
  - Dynamic current systems in plasmas
  - Magnetic fields topology, reconnection
  - Lightning and related phenomena

4. Theoretical calculations and modelling.

- Many of the above mentioned topics suggest the initiation of a fruitful dialogue between experimentalists and theoreticians, both to use the right parameters.

5. Special room will be given for laboratory experiments and model calculations assisting the preparation of the ESA-ROSETTA space mission in 2003 (comet Wirtanen). These experiments can be helpful for the development for the landing-scenario as well as for the design of relevant space-experiments on board of the orbiter and the landers. Similar investigations related to the upcoming Mars missions are very welcomed in our session.

## PS10

### Meteorites and cosmochemistry

Convener: **Dr. Emil Jagoutz**, Max-Planck-Inst. f. Chemie, Postfach 3060, 55020 Mainz, Germany; Tel: +49-6131-305264, Fax: +49-6131-371-290, E-mail: jagoutz@pallas.mpch-mainz.mpg.de  
Co-Convener: **Prof. Dr. Gero Kurat**, Min.-Petr. Abteilung, Naturhistorisches Museum, Postfach 417, 1014 Wien, Austria; Tel: +43-1-52-177-567, Fax: +43-1-52-177-264

Recent advances in the studies of meteorites, planets (including the Earth) and their moons, interplanetary and interstellar dust, solar wind and cosmic rays interaction with solar system matter, presolar grains in meteorites, their isotopic anomalies, and the synthesis of the chemical elements.

## PS11

### Jupiter and its satellites: results from the GALILEO mission

Convener: **Prof. Dr. Gerhard Neukum**, Institut für Planetenerkundung, DLR Forschungszentrum Berlin - Adlershof, Rudower Chaussee 5, 12484 Berlin, Germany; Tel: +49-30-67055-300, Fax: +49-30-67055-303, E-mail: NEUKUM@TERRA.PE.BA.DLR.DE

Co-Convener: **Dr. Torrence V. Johnson**, Mail Stop 264-419, Jet Propulsion Laboratory, California Institute of Technology, 4800 Oak Grove Drive, Pasadena, CA 91109, USA; Tel: +1-818-354-5044, Fax: +1-818-354-6256, E-mail: TJOHNSON@JPLTVJ.JPL.NASA.GOV

## IX. Nonlinear Processes in Geophysics (NP)

### Scaling, fractals and nonlinearity

Conveners: **Prof. Dr. Shaun M. Lovejoy**, Physics Department, McGill University, 3600 University Str., Montreal, Que. H3A 2T8, Canada; Tel: +1-514-398-6537, Fax: +1-514-398-8434, E-mail: SHAUN@PHYSICS.MCGILL.CA

**Dr. Daniel Schertzer**, Laboratoire de Meteorologie Dynamique, Tour 15, Boite 99, Université Pierre & Marie Curie, 4 Place Jussieu, 75252 Paris Cedex 05, France; Tel: +33-1-44274963, Fax: +33-1-4427-6272, E-mail: SCHERTZE@LMD.JUSSIEU.FR

The first session of Nonlinear Processes in Geophysics of the coming EGS General Assembly will continue to develop confrontation between theories and experiments on scaling and multifractal behaviour of geophysical fields. Subjects covered by the subsessions will include:

- tectonic, fracture, faults, seismics, earthquakes, geomorphology and volcanoes
- precipitation, groundwater and surface hydrology
- atmospheric and ocean dynamics, and forecasting turbulence, clouds, radiative transfer, climate, climate change and variability

Areas of focus will include new methods of data analysis (especially for the reliable estimation of multifractal and scaling exponents), applied to rapidly growing data bases from in situ networks remote sensing, as well as from time series. Particular attention will be paid to multifractal analysis of extreme and catastrophic events. The corresponding modelling, prediction and estimation techniques will also be emphasized as will the current debates about fractal geometry and multifractal fields, scaling exponent estimates and multifractal universalities, anisotropy and generalized scale invariance, self-organized criticality and multifractal phase transitions, vectorial vs. scalar multifractal processes, sign-singular measures and extended self-similarity.

**NP1.1/  
SE29**

**Scaling, multifractals and nonlinearity in solid Earth geophysics**

Convener: **Dr. Jean Schmittbuhl**, Dept. T.A.O., Ecole Normale Supérieure, 24, rue Lhomond, 75231 Paris Cedex 05, France; Tel: +33-1-4432-2213, Fax: +33-1-44322200, E-mail: SCHMITTB@GEOPHY.ENS.FR

Co-Conveners: **Dr. Per Bak**, Dept. of Physics, Brookhaven National Laboratory, P.O.Box 5000, Upton, Long Island, NY 11973, USA; E-mail: BAK@CMTH.PHY.BNL.GOV

**Dr. Hans J. Herrmann**, P.M.M.H., E.S.P.C.I., 10, rue Vauquelin, 75231 Paris Cedex 05, France; Tel: +33-1-4079-4722, Fax: +33-1-407-9-4523, E-mail: HANS@PMMH.ESPCI.FR

**Prof. Donald L. Turcotte**, Dept. of Geological Sciences, Cornell University, 2122 Snee Hall, Ithaca, NY 14853-1504, USA; Tel: +1-607-255-7282, Fax: +1-607-254-4780, E-mail: TURCOTTE@GEOLOGY.CORNELL.EDU and GRANT@GEOLOGY.GEO.CORNELL.EDU

Papers on all aspects of scaling, multifractals, and nonlinearity applied to solid earth geophysical problems are welcome. Subjects are expected to include seismicity, tectonics, volcanism, mantle convection, geomagnetics, evolution of landforms and drainage networks, and others that fit under the general heading.

**NP1.2/  
HS18**

**Scaling, fractals and nonlinearity in hydrology**

Convener: **Dr. Christian Onof**, Department of Civil Engineering, Imperial College, Prince Consort Road, London SW7 2BZ, United Kingdom; Tel: +44-171-594-6006, Fax: +44-171-5-94-6042, E-mail: C.ONOF@IC.AC.UK

Co-Conveners: **Jonas Olsson**, Dept. of Water Resources Engineering, University of Lund, Box 118, Solvegatan 13, 22100 Lund, Sweden; Tel: +46-46-222-8995, Fax: +46-46-222-4435, E-mail: JONAS.OLSSON@TVRL.LTH.SE

**Prof. Dr. Thomas M. Over**, Department of Civil Engineering, MS 3136, Texas A & M University, College Station, TX 77843-3136, USA; Tel: +1-409-845-9709, Fax: +1-409-845-6156, E-mail: T-OVER@TAMU.EDU

**Prof. Dr. Daniele Veneziano**, Room 1-348, MIT - Department of Civil and Environmental Engineering, 77 Mass. Ave., Cambridge, MA 02139-4307, USA; Tel: +1-617-253-7199, Fax: +1-617-253-6044, E-mail: VENEZIAN@MIT.EDU

All fields related to hydrological processes are highly variable. Conventional methods often fail to reflect adequately this fundamental feature at all temporal and spatial scales. Fractals and especially multifractals have already shown their great potential for modelling the variability and intermittency with the help of various scale invariant properties and exponents. This session will be devoted to the most recent theoretical and operational developments and applications of multifractal approaches to characterize hydrological media and to model rainfall, surface and groundwater processes.

**NP1.3/  
OA32**

**Scaling, fractals and nonlinearity in oceans and atmosphere**

Convener: **Dr. Francois Schmitt**, LMD, boîte 99, Université Paris VI, 4, place Jussieu, 75230 Paris Cedex 05, France; Tel: +33-1-44274963, Fax: +33-1-44276272, E-mail: SCHMITT@LMD.JUSSIEU.FR after 1 October 1996 Institut Royal Meteorologique de Belgique, Section Climatologie Dynamique, Avenue Circulaire 3, 1180 Brussels, Belgium; Fax: +32-2-375-12-59, E-mail: schmitt@mocka.ccr.jussieu.fr

Co-Conveners: **Dr. Robert F. Cahalan**, Laboratory for Atmospheres, NASA - Goddard Space Flight Center, Greenbelt, MD 20771, USA; Tel: +1-301-286-4276, Fax: +1-301-286-1627, E-mail: CAHALAN@CLOUDS.GSFC.NASA.GOV

**Dr. Gregory Falkovich**, Dept. of Physics, Weizmann Institute of Science, 76100 Rehovot, Israel; Tel: +972-8-934-2830, Fax: +972-8-934-4109, E-mail: fnfal@wicc.weizmann.ac.il

**Prof. Vladimir V. Yanovsky**, Lab. for Turbulence Research, Institute for Single Crystals, Lenin ave. 60, 310108 Kharkov, Ukraine; Fax: +380-572-320-273, E-mail: KFTI@ROCKET.KHARKOV.UA

This session will highlight nonlinear aspects of ocean and atmosphere turbulence and climate dynamics, manifested through scaling and multifractal properties of observed fields. Theoretical and experimental (including remote sensing) studies of turbulence, seasonal, interannual and climate-scale variations and coupling across a broad range of scales are of primary interest. Related problems include scaling and multifractal analysis and modelling of passive and active scalars, clouds, radiative transfer and radiation interac-



tions with atmosphere and surface, nonlinear waves, global change problems, ozone depletion, diffusion & transport in the ocean & atmosphere.

**NP1.4/  
ST8 Nonlinear dynamics in the heliosphere:  
shocks, solitons and fractals**

Convener: **Dr. Wieslaw M. Macek**, Space Research Centre, Polish Academy of Sciences, Bartycka 18 A, 00716 Warsaw, Poland; Tel: +48-22-403766, Fax: +48-39-121-273, E-mail: MACEK@CBK.WAW.PL

Co-Convener: **Prof. Dr. Eckart Marsch**, Max-Planck-Institut für Aeronomie, Max-Planck-Str. 2, 37191 Katlenburg-Lindau, Germany; Tel: +49-5556-979-292, Fax: +495556-979-240, E-mail: MARSCH@LINAX1.MPAE.GWDG.DE

The main aim of this session is to discuss nonlinear phenomena in the heliosphere. Typical examples are: various collisionless shocks, including planetary, cometary and interplanetary shocks and the heliospheric termination shock, and the related large-amplitude and solitary plasma waves. As fractal analysis of the solar wind flow is of great interest, the results of research on scaling and fractal properties of the solar wind fluctuations will be considered. The application of time-series analysis and structure functions, which are new nonlinear methods for data analysis, is especially relevant for studying the question of whether the irregular behaviour of the solar wind flow results from intrinsic nonlinear dynamics or external random forces. Both theoretical and experimental contributions are solicited.

**NP2.1/  
OA38 Nonlinear time series analysis and chaos  
Predictability**

Convener: **Dr. Myles R. Allen**, Space Science Dept., Rutherford Appleton Laboratory, Chilton Didcot, Oxfordshire OX11 0QX, United Kingdom; Tel: +44-1235-446428, Fax: +44-1235-445848, E-mail: m.allen1@physics.oxford.ac.uk

Co-Convener: **Dr. Michael K. Davey**, Hadley Centre for Climate Prediction, Meteorological Office, London Road, Bracknell, Berkshire RG12 2SZ, United Kingdom; Tel: +44-1344-854648, Fax: +44-1344-854898, E-mail: MKDAVEY@METO.GOV.UK

Our ability to predict the evolution of a geophysical system is limited by ignorance of the system's dynamics and trajectory; chaotic behaviour; stochastic forcing; unknown external forcing or some combination of these. Useful forecasts depend on some objective measure of uncertainty. We invite papers relating to quantifying and interpreting predictability in the analysis of non-linear systems and climate forecasting. We encourage papers focussing on climate prediction on seasonal to interannual timescales, including: efficient use ensembles; quantifying trajectory uncertainty with limited data; various measures of prediction "skill"; and using predictability as a diagnostic tool. Papers investigating interactions and possible feedbacks between different sources of uncertainty (e.g. chaos and

stochastic forcing; incorrect model physics and unknown external forcing) are particularly welcome.

**NP2.2 Nonlinear time series analysis**

Convener: **Prof. Dr. Jürgen Kurths**, Max-Planck-Arbeitsgruppe Nichtlineare Dynamik, Universität Potsdam, Am Neuen Palais, Postfach 601553, 14415 Potsdam, Germany; Tel: +49-331-977-1429, Fax: +49-331-977-1142, E-mail: JUERGEN@AGNLD.UNI-POTSDAM.DE

Co-Convener: **Dr. Jaroslav Stark**, University College London, Gower Street, London WC1 6BT, United Kingdom; Tel: +44-171-391-1368, Fax: +44-171-380-0986, E-mail: J.STARK@UCL.AC.UK

**Turbulence and diffusion  
Dynamics and transport of active and  
passive tracers**

Convener: **Dr. Bach Lien Hua**, Lab. Physique des Océans, IFREMER, B.P. 70, 29280 Plouzané, France; Fax: +33-98224496, E-mail: LIEN@IFREMER.FR; *after 18 October 1996* Fax: +33-2-98224496

Co-Convener: **Dr. Rubén Alberto Pasmante**, KNMI - Royal Netherlands Meteorological Institute, Postbus 201, 3730 AE De Bilt, The Netherlands; Tel: +31-30-220-6754, Fax: +31-30-221-0247, E-mail: PASMANTE@KNMI.NL

This session will be devoted to fundamental aspects as well as geophysical applications of the transport of tracers by laminar or turbulent flows.

The scope of the session is wide, a variety of topics will include advection of passive and active tracers, chemically reacting tracers, dispersion characteristics, quantification of mixedness, advection by vortex structures, etc. Theoretical, numerical, experimental and observational studies are welcomed.

**NP3.2 Geophysical turbulence**

Convener: **Dr. Peter L. Read**, Clarendon Laboratory, Atmospheric, Oceanic & Planetary Physics, Parks Road, Oxford OX1 3PU, United Kingdom; Tel: +44-1865-272082, Fax: +44-1865-272923, E-mail: p.read@physics.ox.ac.uk

**NP3.3 Vortex dynamics**

Convener: **Dr. David G. Dritschel**, University of Cambridge, Dept. of Applied Mathematics and Theoretical Physics, Silver Street, Cambridge CB3 9EW, United Kingdom; Tel: +44-1223-339-739, Fax: +44-1223-337918, E-mail: D.G.DRITSCHEL@DAMTP.CAM.AC.UK

Co-Convener: **Prof. Vladimir Zeitlin**, LMD, BP 99, Université Pierre & Marie Curie, 4 Place Jussieu, 75252 Paris Cedex 05, France; Tel: +33-1-4427-6233, Fax: +33-1-4427-6272, E-mail: ZEITLIN@LMD.ENS.FR

This session will be devoted to fundamental aspects of vortex dynamics in the Earth's atmosphere and oceans as well as in other planetary atmospheres (and oceans, just in case!). These



include vortex properties (e.g., generic structure, stability), vortex-mean flow and vortex-vortex interactions, vortex-topography and vortex-gravity wave interactions, as well as dependences on the flow stratification, its depth, and conditions at its boundaries. Theoretical, numerical, experimental and observational studies are welcomed.

**NP4.1/  
OA35 Nonlinear waves and natural hazards  
Nonlinear waves, instabilities and wave flow interactions**

Convener: **Dr. Victor I. Shrira**, Shirshov Institute of Oceanology, Russian Acad. of Sciences, Krasikova 23, 117218 Moscow, Russia; Tel: +7-095-124-7565, Fax: +7-095-124-5983, E-mail: shrira@glas.apc.org and victor@castor.univ-mrs.fr

Co-Conveners: **Prof. Dr. Lev A. Ostrovsky**, ETL/ERL, NOAA, 325 Broadway, Boulder, CO 80303, USA; Tel: +1-303-497-6138, Fax: +1-303-497-3577, E-mail: lostrovsky@etl.noaa.gov

**Prof. Dr. Manuel G. Velarde**, Instituto Pluridisciplinar, Universidad Complutense de Madrid, Paseo Juan XXIII, No. 1, 28040 Madrid, Spain; Tel: +34-1-394-3242, Fax: +34-1-394-3243, E-mail: mvelarde@eucmvx.sim.ucm.es

The main aims of the session are to discuss the universal mathematical models on which the description of a variety of nonlinear geophysical phenomena can be based, and to investigate specific physical mechanisms of these phenomena. We are mainly interested in works on geophysical fluid dynamics dealing with nonlinear wave processes and wave-related instabilities. This area includes nonlinear dynamics of surface water waves with and without wind, internal waves, wave-turbulence interactions, solitons, wave generation by currents in ocean and atmosphere, nonlinear stages of flow instabilities, critical layers, nonlinear wave, etc. Theoretical, numerical, experimental and observational works are welcomed.

**NP4.2/  
NH6 Coherent structure and natural hazards**

Convener: **Prof. Semen S. Moiseev**, Space Research Institute, Profsoyuznaya Ulitsa 84/32, 117810 Moscow, Russia; Tel: +7-095-333-4167, Fax: +7-095-310-7023, E-mail: SMOISEEV@ESOCI.IKIRSSI.RU and SMOISEEV@LION.IKIRSSI.RU

Co-Convener: **Prof. Luis Alberto Mendes-Victor**, Centro de Geofisica, Faculdade de Ciencias da Universidade de Lisboa, Rua de Escola Politecnica, 58, 1200 Lisboa, Portugal; Tel: +351-1-3955293, Fax: +351-1-3953327, E-mail: FLVICTOR@SKULL.CC.FC.UL.PT

The symposium will be devoted to mechanisms of generation of coherent structures and their relation with seismogenesis and cyclogenesis. It will also include the problems of collision of comets with planets and the role of coherent processes as well as the analysis of causes of anomalous behaviour of dissipative coefficients and the relations of these anomalies with the generation of coherent structures.

**X. Natural Hazards (NH)**

**NH1 Prediction and management of extreme events**

Convener: **Prof. Stefano Tinti**, Dipartimento di Fisica, Settore di Geofisica, Universita di Bologna, Viale Berti Pichat 8, 40127 Bologna, Italy; Tel: +39-51-6305025, Fax: +39-51-6305058, E-mail: STEVE@IBOGFS.DF.UNIBO.IT

Co-Convener: **Dr. Bernard Massinon**, Lab. de Detection et de Geophysique, Commissariat a l'Energie Atomique, B.P. 12, 91680 Bruyeres le Chatel, France; Tel: +33-1-69265378, Fax: +33-1-6926-7023, E-mail: massinon@ldg.bruyeres.cea.fr

This symposium intends to be a forum where all aspects related to the prediction of the extreme events, such as earthquakes, volcanic eruptions, flooding, landslides, tsunamis, forest fires, etc. and to the management of the pre-event, event and post-event phases. Contributions from scientists, technicians and decision makers involved in forecasting methods and simulation models, in hazard/risk assessment, in development, implementation and operation of monitoring and alarm systems, in preparedness and mitigation planning, in emergency management and in post-disaster intervention are welcomed.

**NH2 Techniques and tools for mapping natural hazards and risk impact on the developed environment**

Convener: **Dr. Fausto Guzzetti**, CNR-IRPI, Via della Madonna Alta, 126, 06128 Perugia, Italy; Tel: +39-75-505-4943, Fax: +39-75-505-1325, E-mail: FAUSTO@KENOBY.IRPI.UNIPG.IT

Natural catastrophes, such as earthquakes, hurricanes, tsunamis, flash floods, volcanic eruptions and landslides constitute a major problem in many developing and developed countries. In the recent years the population growth and the expansion of settlements and life-lines over potentially hazardous areas have largely increased the impact of natural disasters. Third-world countries have been unable to face the high costs involved in controlling natural hazards through major engineering works and rational land-use planning. Owing to the global recession, industrialized societies are increasingly less eager to invest a great deal of money to reduce natural risks by means of structural measures. The new issue seems to be the development of warning systems and land utilization regulations aimed at minimizing the loss of lives and property damage without investing in long-term, costly projects of ground stabilization. Toward the end of the International Decade for Natural Disaster Reduction (IDNDR) the symposium is an opportunity to critically evaluate current methods for predicting natural catastrophes, for mitigating their impact and to investigate the potential of new technologies. Among these new technologies Geographical Information Systems, Remote Sensing, telecommunications, and tools to support the decision-making process are the most promising.

**NH3 Seismic hazard assessment in active tectonic regions**

Convener: **Dr. Jean-Philippe Avouac**, Lab. de Geophysique, Commissariat a l'Energie Atomique, B.P. 12, 91680 Bruyeres le Chatel, France; Tel: +33-1-6926-4675, Fax: +33-1-6926-7023, E-mail: AVOUAC@LDG.BRUYERES.CEA.FR  
Co-Convener: **Dr. Rodolfo Console**, Istituto Nazionale di Geofisica, via di Vigna Murata 605, 00143 Rome, Italy; Tel: +39-6-51860-417, Fax: +39-6-504-1181, E-mail: CONSOLE@ING750.INGRM.IT

In active tectonic areas a lot of information can be obtained such as localization of active faults and note of slip and palaeoseismicity of these faults as well as of regional deformation. The symposium will cover methodological aspects and examples of such studies, and their bearing on seismic hazard assessment. Application to zones of moderate seismicity would also be most welcome.

**NH4 Hydrology of extremes and numerical weather predictions**

Convener: **Robert J. Moore**, Institute of Hydrology, McLean Building, Crowmarsh Gifford, Wallingford, Oxon OX10 8BB, United Kingdom; Tel: +44-1491- 838800, Fax: +44-1491-692424, E-mail: ROBERT.J.MOORE@IOH.AC.UK  
Co-Conveners: **Dr. Maria Carmen Llasat**, Dept. de Fisica de Astronomia y Meteorologia, Avda. Diagonal 647, 08028 Barcelona, Spain; Tel: +34-3-4021124, Fax: +34-3-4021133, E-mail: CARMELL@MIZAR.AM.UB.ES  
**Prof. Franco Siccardi**, Institute of Hydraulics, Universita di Genova, Via Montallegro 1, 16145 Genova, Italy; Tel: +39-10-3532496, Fax: +39-10-3532481, E-mail: FRANCO@IDRA.UNIGE.IT

**NH5 Submarine landsliding**

Convener: **Dr. John Inge Svendsen**, Centre for Studies of Environment and Resources, University of Bergen, Allegaten 70, 5007 Bergen, Norway; Tel: +47-55-584251, Fax: +47-55-589687, E-mail: JOHN.SVENDSEN@SMR.UIB.NO  
Co-Convener: **Dr. Ph. Heinrich**, Lab. de Detection et de Geophysique, Commissariat a l'Energie Atomique, B.P. 12, 91680 Bruyeres le Chatel, France; Tel: +33-1-69265956, Fax: +33-1-6926-7023, E-mail: heinrich@ldg.bruyeres.cea.fr

**NH6/ NP4.2**

**Coherent structure and natural hazards**

Convener: **Prof. Semen S. Moiseev**, Space Research Institute, Profsoyuznaya Ulitsa 84/32, 117810 Moscow, Russia; Tel: +7-095-333-4167, Fax: +7-095-310-7023, E-mail: SMOISEEV@ESOC1.IKI.RSSI.RU and SMOISEEV@LION.IKI.RSSI.RU

Co-Convener: **Prof. Luis Alberto Mendes-Victor**, Centro de Geofisica, Faculdade de Ciencias da Universidade de Lisboa, Rua de Escola Politecnica, 58, 1200 Lisboa, Portugal; Tel: +351-1-3955293, Fax: +351-1-3953327, E-mail: FLVICTOR@SKULL.CC.FC.UL.PT

The symposium will be devoted to mechanisms of generation of coherent structures and their relation with seismogenesis and cyclogenesis. It will also include the problems of collision of comets with planets and the role of coherent processes as well as the analysis of causes of anomalous behaviour of dissipative coefficients and the relations of these anomalies with the generation of coherent structures.

**NH7**

**Natural hazards in active volcanic regions**

Convener: **Dr. Giovanni Macedonio**, Centro di Studio per la Geologia Strutturale e Dinamica dell'Appennino, CNR, Via S. Maria 53, 56126 Pisa, Italy; Tel: +39-50-847-273, Fax: +39-50-500-675, E-mail: MACEDON@DST.UNIPI.IT  
Co-Convener: **Dr. Heidy Marita Mader**, Dept. of Geology, Wills Memorial Building, University of Bristol, Queens Road, Bristol BS8 1RJ, United Kingdom; Tel: +44-117-928-9161, Fax: +44-117-925-3385, E-mail: h.m.mader@bristol.ac.uk

The symposium will cover the main aspects of the volcanic hazard assessment technologies, including theoretical modelling, laboratory studies, and volcanic activity monitoring. The objective of the symposium is to present the state-of-the-art in the knowledge of the fundamental volcanic processes, in the quantitative description of the emplacement mechanisms of the volcanic products and related phenomena, in the forecasting of volcanic eruptions, and in the volcanic hazard and risk maps production.



## XXIII General Assembly Nice, 20-24 April 1998

### Call-for-Proposals

You and your colleagues are hereby invited to submit proposals for the Scientific Programme either directly to the EGS Office or at the Open Section meetings on Tuesday, 22 April 1997, at 17.00 in the Congress Centre during the 1997 General Assembly in Vienna.

## Forthcoming Meetings

The following is a list of forthcoming meetings that may be of interest to EGS members. If you are organizing a meeting that should be included in future lists, please send us details including date, title, location and a contact name and address as soon as possible. Inclusion is free.

### 1996

October 2-9, 1996; **South Pacific Applied Geoscience Commission (SOPAC), 25th Annual Session**, Rarotonga, Cook Islands. Details from: laisa@sopac.org.jf or crook@iniki.soest.hawaii.edu

October 3-4, 1996; **Transform Methods in Solid Mechanics**, München, Germany. Details from: Prof. H. Grundmann, Lehrstuhl f. Baumechanik, TU München, Arcisstr. 21, 80290 München, Germany; E-mail: baumech@peterson.baume.bauwesen.tu-muenchen.de

October 8-9, 1996; **Tectonic Zones in the Earth's Crust and their Manifestations on the Surface**, Praha, Czech Republic. Details from: J. Gruntorad, Silicate Society - Czech Group of Scientific and Technical Societies, Novotného lávka 5, 11001 Praha 1, Czech Republic; Tel: +42-2-2108-2337, Fax: +42-2-2422-7836.

October 9-13, 1996; **Exhumation Processes: Normal Faulting, Ductile Flow and Erosion**, Crete, Greece. Details from: M.T. Brandon, Dept. of Geology and Geophysics, Yale University, P.O. Box 208109, New Haven, CT 06520-8109, USA; Tel: +1-203-432-3135, Fax: +1-203-432-3134, E-mail: mark.brandon@yale.edu

October 14-18, 1996; **Mountain Research - Challenges and Directions for the 21st Century**, Bishkek, Kyrgyzstan. Details from: E.J. Kirk, AAAS, 1333 H St. N.W., Washington, DC 20005, USA; Tel: +1-202-326-6493, Fax: +1-202-289-4958, E-mail: ekirk@aaas.org

October 14-18, 1996; **2nd International Lunar Workshop/ILEWG Meeting**, Kyoto Research Park, Kyoto, Japan. Details from: Secretary of International Program Committee, c/o Japan Space Forum, Heiwa Building 7F, 1-7-1 Hamamatsu-Cho, Minato-Ku, Tokyo, Japan. Tel: +81-3-3459-1651, Fax: +81-3-5402-7521, E-mail: kyq03544@niftyserve.or.jp

October 21-22, 1996; **Tidal Science 1996**, London, United Kingdom. Details from: R.D. Ray, HSTX, NASA/GSFC, Code 926, Greenbelt, MD 20771, USA; Tel: +1-301-286-3691, Fax: +1-301-286-1760, E-mail: richard.ray@gsfc.nasa.gov

October 25-27, 1996; **International Conference on Chaos, Fractals & Models 96**, University of Pavia, Italy. Details from: G. Salvadori, University of Pavia, DFNT, Via Bassi 6, 27100 Pavia, Italy; Tel: +39-382-507-438, Fax: +39-382-526-938, E-mail: salvadori@pavia.infn.it

November 4-7, 1996; **Eco-Informa '96**, Epcot Science and Technology, Lake Buena Vista, Florida, USA. Details from: ERIM/Eco-Informa, P.O. Box 134001, Ann Arbor, MI 48113-4001, USA; Tel: +1-313-994-1200 ext 3234, Fax: +1-313-994-5123, E-mail: wallman@erim.org or http://www.erim.org/CONF/ECOINF/ECO.html

November 4-15, 1996; **Third Workshop on Three-Dimensional Modelling of Seismic Waves Generation, Propagation and their Inversion**, International Centre for Theoretical Physics, Trieste, Italy. Details from: Gabriella de Meo, I.C.T.P., P.O. Box 586, 34100 Trieste, Italy; Tel: +39-22-40111, Fax: +39-22-4163; E-mail: smr942@ictp.trieste.it

November 10-16, 1996; **Shallow Level Processes in Ocean Island Magmatism: Distinguishing Mantle and Crustal Signatures**, Tenerife, Canary Islands. Details from: AGU Meetings Dept., 2000 Florida Avenue, Washington DC 20009, USA; Tel: +1-202-462-6900.

November 10-19, 1996; **Introductory Training Course on Paleomagnetic and Rock Magnetic Applications in Geological Sciences**, Islamabad, Pakistan. Details from: Course/Seminar Organizer, ITC-PARMAGS, Geoscience Laboratory, Geological Survey of Pakistan, Shahzad Town, P.O. Box No. 1461, Islamabad 44000, Pakistan; Fax: +92-51-240223, E-Mail: parmags%geolab@sdnpk.undp.org

November 18-23, 1996; **International Postgraduate Training Course "Modelling Water Flow and Solute Transport in the Soil-Water-Plant-Atmosphere System"**, Wageningen, The Netherlands. Details from: International Training Centre (PHLO), Wageningen Agricultural University, P.O. Box 8130, 6700 EW Wageningen, The Netherlands; Tel: +31-317-484092/3, Fax: +31-317-426547.

November 20-21, 1996; **International Seminar on Paleomagnetic Studies in Himalaya - Karakoram Collision Belt, Islamabad, Pakistan**. Details from: Course/Seminar Organizer, ITC-PARMAGS, Geoscience Laboratory, Geological Survey of Pakistan, Shahzad Town, P.O. Box No. 1461, Islamabad 44000, Pakistan; Fax: +92-51-240223, E-Mail: parmags%geolab@sdnpk.undp.org

December 15-19, 1996; **AGU Fall Meeting**, San Francisco, California, USA. Details from: AGU, 2000 Florida Avenue NW, Washington DC 20009, USA; Tel: +1-202-939-3203, Fax: +1-202-328-0566.

### 1997

March, 3-7, 1997; **57th Annual Meeting and Technical Exhibition Deutsche Geophysikalische Gesellschaft (DGG)**, Potsdam, Germany. Details from: Prof. Dr. V. Haak, GeoForschungsZentrum Potsdam, Telegrafenberg, 14473 Potsdam, Tel: +49-331-8877-326, Fax: +49-331-8877-422; E-mail: vhaak@gfz-potsdam.de

March 10-13, 1997; **Stability and Transition of Boundary-Layer Flows**, Stuttgart, Germany. Details from: Prof. S. Wagner, Inst. f. Aero- & Gasdynamik, Univ. Stuttgart, Pfaffenwaldring 21, 70550 Stuttgart, Germany; E-mail: wagner@iag.uni-stuttgart.de

March, 17-19, 1997; **Thematic Conference on Remote Sensing for Marine and Coastal Environments**, Orlando, Florida, USA. Details from: R. Rogers, ERIM, Box 134001, Ann Arbor MI, USA 48113-4001; Tel: +1-313-994-1200 Ext. 3382, Fax: +1-313-994-5123, E-mail: rogers@erim.org

March 17-19, 1997; **Active control of turbulent shear flows**, Berlin, Germany. Details from: Prof. H.H. Fernholz, Hermann-Föttinger-Institut, Technische Universität Berlin, Str. des 17. Juni 135, 10623 Berlin, Germany; E-mail: hfi@pi.tu-berlin.de

March 23-27, 1997; **EUG 9**, European Union of Geosciences, Strasbourg, France. Details from: EUG 9 Office, EOPG, 5 rue Rene Descartes, 67084 Strasbourg Cedex, France; Tel: +33-88416393 or +33-88450191, Fax: +33-88603887, E-mail: eug@eopg.u-strasbg.fr, http://sparc.ipgp.jussieu.fr/EUG/

April, 6-9, 1997; **6th Conf. Sinkholes, Eng. & Env. Impact Karst**, Springfield, MO, USA. Details from: B.F. Beck, P.E. LaMoreaux & Associates, Inc., P.O. Box 4578, Oak Ridge, TN 37831-4578, USA; Tel: +1-423-483-7483, E-mail: pelaor@use.usit.net

April 7-9, 1997; **Material Identification Using Mixed Numerical/Experimental Methods**, Kerkrade, The Netherlands. Details from: Prof. H. Sol, Vrije Universiteit Brussel, Faculteit Toegepaste Wetenschappen, Dienst analyse van structuren, Pleinlaan 2, 1050, Brussel, Belgium; E-mail: hugos@vnet3.vub.ac.be.

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**Newsletter** is the official bulletin of the  
European Geophysical Society.

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Cambrian Printers, Llanbadarn Road, Aberystwyth,  
Dyfed, SY23 3TN, United Kingdom (Tel: +44-1970-  
627111, Fax: +44-1970-615497)

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The Newsletter is published four times per year. Sub-  
scription price to regular members is included in their  
annual dues. Information on institutional subscriptions  
is available on request.

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**XXII General Assembly  
Vienna, Austria  
21 -25 April 1997**



- ☆ **Location:** Austria Center Vienna
- ☆ **Deadline for applying for EGS Support Awards:** 15 December 1996
  - Original to EGS Office
  - Copy to Convener
- ☆ **Deadline for receipt of Abstracts:** 15 December 1996
  - Original to EGS Office
  - Copy to Convener
- ☆ **Notice of Status to Main Authors:** 13-24 January 1997
- ☆ **Letter of Schedule & Overall Time Schedule:** 28 February 1997
- ☆ **Deadlines for Pre-Registration & Accommodation**
  - First Deadline for Pre-Registration: 31 January 1997
  - Second & Final Deadline for Pre-Registration: 28 March 1997
  - Deadline for advanced Hotel Booking: 21 March 1997

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- ☆ **Deadline for Daily Programme and Schedule of additional Panel or Committee Meetings:** 4 April 1997
- ☆ **Congress Office and On-Site Registration & Hotel Booking**
  - Sunday, 20 April 1997 15.00-20.00
  - Monday-Friday, 21-25 April 1997 08.00-18.00
- ☆ **Scientific Sessions**
  - Monday, 21 April 1997 09.00-17.00
  - Tuesday, 22 April 1997 09.00-17.00
  - Wednesday-Friday, 23-25 April 1997 09.00-18.30
- ☆ **Detailed Information on WWW:**  
<http://www.mpaе.gwdg.de/EGS/EGS.html>